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MAGAZINE OF BOTANY.

PAXTON'S

MAGAZINE OF BOTANY,

AND

REGISTER OF FLOWERING PLANTS.

"Flowers of all hue."

SMITHSONIAN INSTITUTION
FEB 6 1930
SPECIAL COLLECTIONS

VOLUME THE NINTH.

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TO

HIS ROYAL HIGHNESS

THE

DUKE OF SUSSEX, K.G. &c. &c.

THE KIND AND NOBLE PATRON OF ALL THE ARTS THAT CIVILIZE, REFINE, AND EXALT THE HUMAN RACE;

This Ninth Volume

OF

THE MAGAZINE OF BOTANY

IS,

WITH THE CONDESCENDING APPROVAL OF HIS ROYAL HIGHNESS,

MOST RESPECTFULLY INSCRIBED,

BY

HIS ROYAL HIGHNESS'S MOST OBEDIENT AND VERY HUMBLE SERVANT,

JOSEPH PAXTON.

ADVERTISEMENT.

Although, in general, we prefer furnishing our readers with the means of forming their own estimate of our Magazine, we do not wish to neglect the opportunity, which custom yearly supplies, of reverting to its progress, and renewing our assurances that its subsequent improvement shall always be determined by our own or the public perceptions of its necessity.

The change, which began with this Volume, in the preparation of its Embellishments, has now been amply tested, and, we are persuaded, will be as satisfactory to others as it is to ourselves. But, as we recognise no goal short of absolute perfection, we shall not rest contented with seeing this feature of our work in advance of all other contemporaries, and shall continue those measures which may still further elevate the character of its Plates.

Illustrations of a minor nature have been more freely introduced to this than to recent volumes. Among these, the design for a Conservative Wall may be specially referred to. It is a great improvement on the one existing at Chatsworth, which has been so much noticed, and will afford as much interest as an ordinary greenhouse, at a considerably less expense.

Anxious to give a stimulus, rather than a sedative, to the pulsations of rational minds, we have tried to gratify the prevailing taste for chemical inquiries by obtaining the aid of a gentleman whose talent is well known and appreciated, and who has written for us the interesting papers on "Gardening as a Science." At the same time, attentive to the wants of the amateur and the self-instructed, we have inserted many papers which elucidate simple, important, and fundamental principles and practices in Floriculture. We have endeavoured to elevate into rules, of real moment, some of those little attentions which the best cultivators bestow upon their plants; which are slighted or despised by men of a particular stamp, but which are mightily influential in promoting the adornment of private gardens, and the beauty of our leading exhibitions.

When so large a field is open for trivial communications in the newspapers and smaller periodicals of the day, we feel that it would be improper to fill much of our space with *merely* practical details. Hence, where we have treated of the culture of plants, we have likewise blended with our directions, statements and suggestions which bear on the science generally, and explain the philosophy of the processes discussed.

For the following year, we have similar materials in store; equal opportunities of obtaining others; and the same readiness to appropriate them to the common use. We have established for ourselves a very high standard, which we shall never cease to aim at; nor fall short of, through negligence or insufficient effort.

Our obligations are respectfully tendered to all who, in any way, have shown themselves our friends during the past year; and who are now both individually and aggregately solicited to continue their kind offices.

CHATSWORTH,
December 20, 1842.

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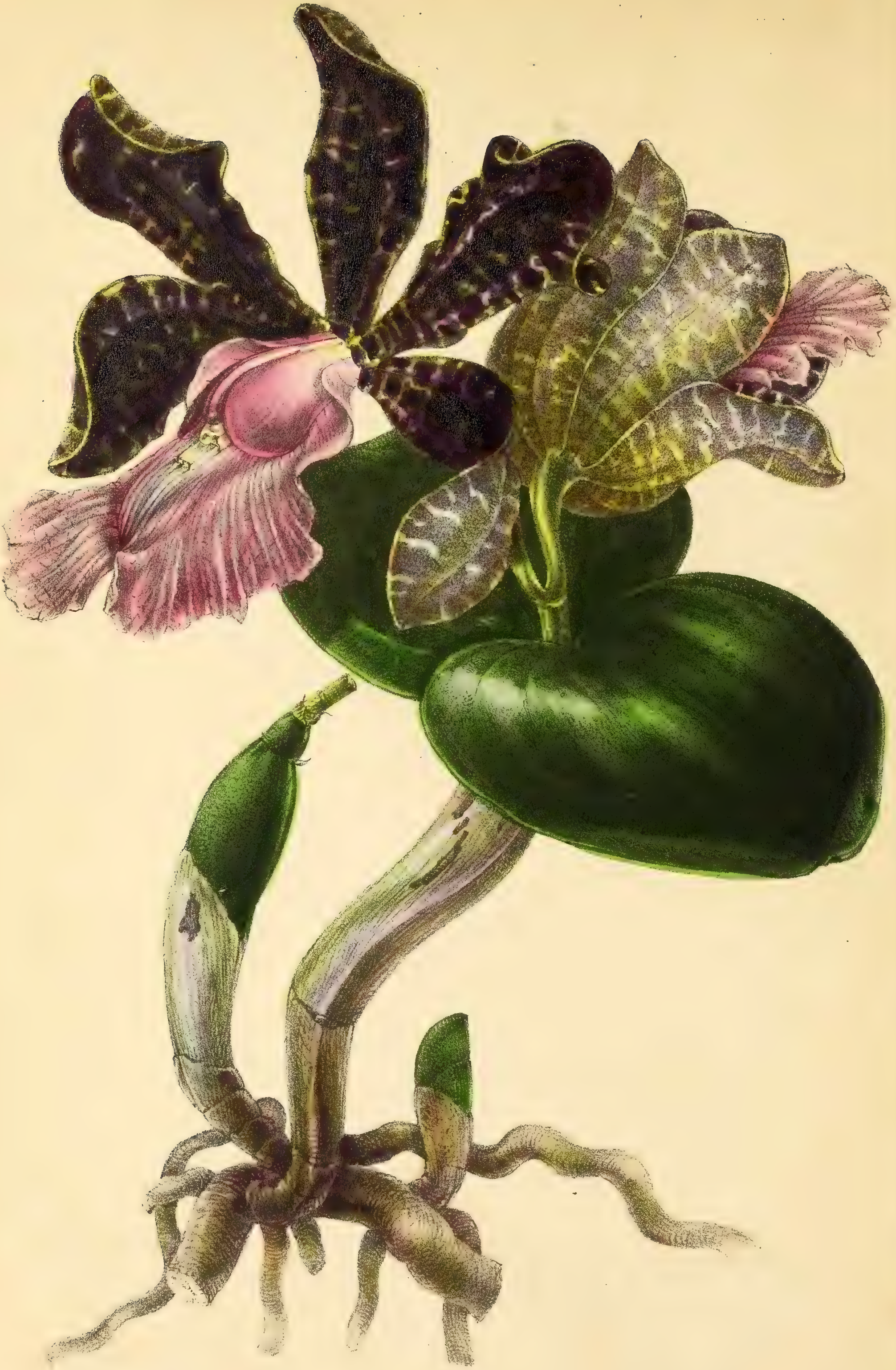


S. Holden. del. & Lith.

Cattleya Aclandiæ

CATTLEYA ACLANDIÆ.

(Lady Acland's Cattleya.)

Class.
GYNANDRIA.

Order.
MONANDRIA.

Natural Order.
ORCHIDACEÆ.

Generic Character. — *Sepals* membranaceous or fleshy, spreading, equal. *Petals* often larger. *Labellum* cucullate, involving the column, three-lobed or undivided. *Column* club-shaped, elongated, semicylindrical, marginate, joined to the labellum. *Anthers* fleshy, four-celled, usually with a membranaceous margin. *Pollen-masses* four.

Specific Character.—*Plant* epiphytal. *Leaves* oblong. *Flowers* solitary or in pairs. *Sepals* and *petals* lanceolate, equal, incurved, spotted with purple on a brownish ground. *Labellum* plain, bare, with the lower part dilated and slightly wavy, and the extremity roundish or kidney-shaped and emarginate.

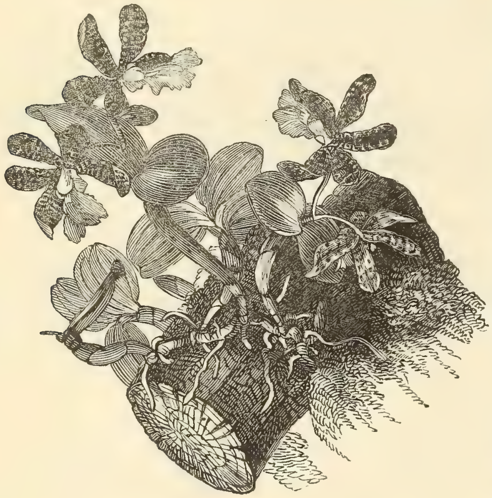
With a liberality which, in the instance of so scarce and tender a plant, calls for the highest encomiums, G. Barker, Esq., of Birmingham, exhibited a fine specimen of this beautiful species at one of the grand garden shows of the Horticultural Society in the last summer; and through the kindness of that gentleman's gardener, Mr. Insleay, we were permitted to have the admirable drawing made which is now presented.

In so rich and splendid a genus as Cattleya, it is sufficient that a new species does not fall behind those previously introduced in interest; and we may safely assert that the plant here depicted, although not equal to *C. labiata* in the gorgeousness of its tints, nor to *C. crispa* in delicacy, is quite worthy of ranking by their side as an ornamental epiphyte; while its dwarfness, with the large comparative size and great richness of its blossoms, impart an agreeable novelty to its appearance.

The honour of first introducing it is believed to belong to Sir T. Acland, Bart., by whom it was received from Brazil in 1839. The specimen thus imported flowered soon afterwards, and was named by Dr. Lindley in compliment to Lady Acland. Originally, it produced only one flower on a stem; but that this arose from the individual being in a weakly state, has since been evident by Mr. Barker's plant bearing two, of superior dimensions and beauty, on the same stalk. These blossoms were, indeed, superlatively excellent, and, surmounting so apparently feeble an object as the plant seems to be, excited general astonishment. About two months subsequently to the exhibition above mentioned, Messrs. Loddiges flowered a lovely variety of this plant, in which the floral sepals and petals were much paler and less spotted than usual. Probably, on becoming further known, it will be found to vary still more in the colours of its flowers, and likewise to produce them in more copious clusters.

It is associated with *C. bicolor* in the form of its labellum; and, in conjunction with that species, constitutes a distinct section of the genus. The peculiarity is in the lip, which is too narrow and too expansive to cover the column; all other species having the column completely enclosed by the upper portion of the lip.

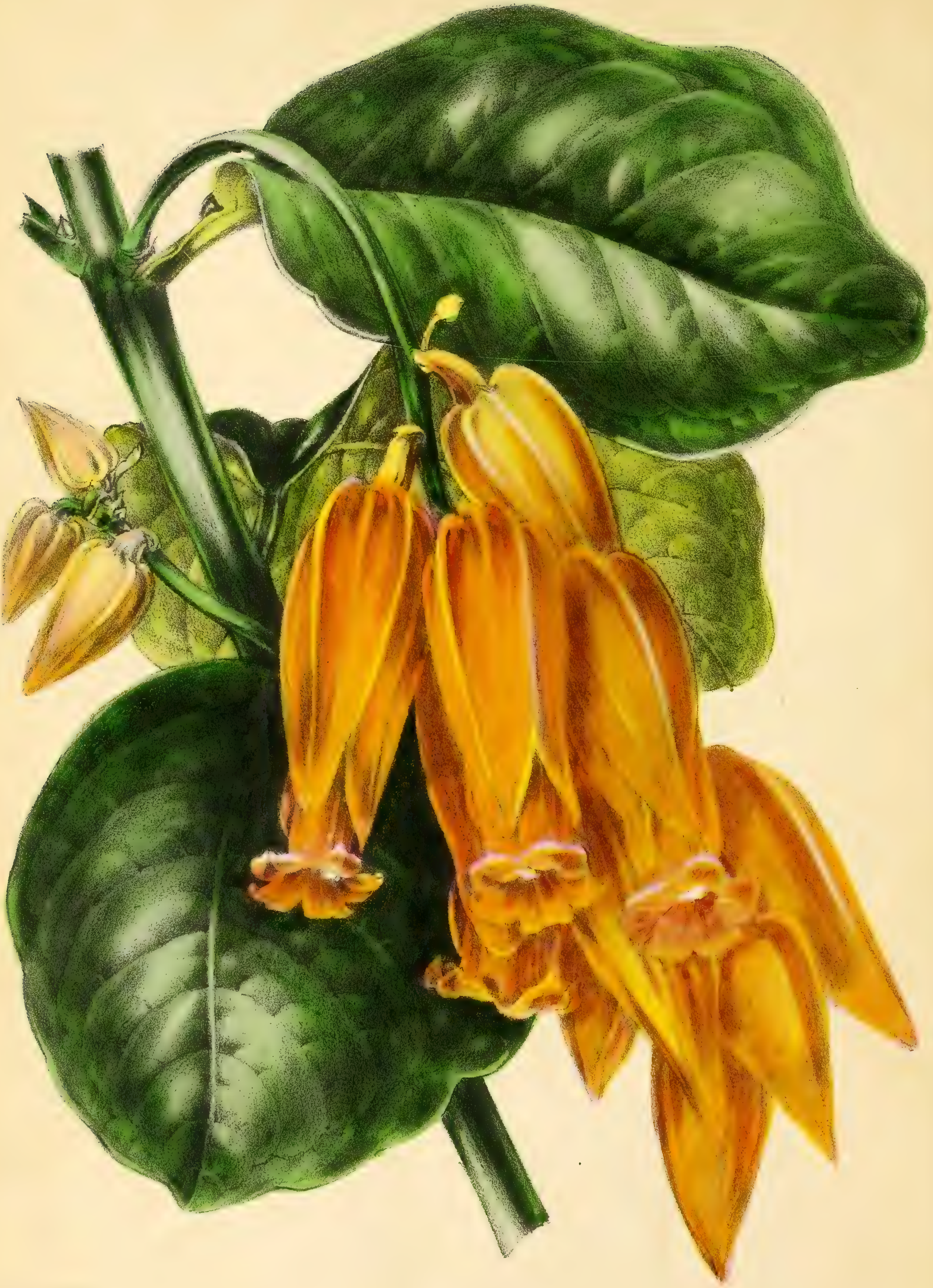
Cattleyas, and this among the rest, do not need so high a temperature nor so much moisture as the majority of Orchidaceæ; requiring a kind of intermediate treatment between the most decidedly tropical sorts and those from colder localities. *C. Aclandiæ*, however, differs from its allies in flourishing best on a suspended log of wood, without any protection to its roots beyond a little moss. The lowness of its growth fits it admirably for such a position, and it is both cultivated and seen to greater advantage under these circumstances. In winter, it should receive hardly any water, and be kept entirely torpid.



By carefully removing one of the stems, and subjecting it to the treatment common to older plants, the species may be easily propagated.

The wood-cut shows the entire plant on a greatly reduced scale.

The generic name commemorates W. Cattley, Esq., of Barnet, Hertfordshire, one of the earliest collectors of Orchidaceæ, and a great promoter of practical botany.



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Brugmansia floribunda.

BRUGMÁNSIA FLORIBÚNDA.

(Many-flowered Brugmansia.)

Class.
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
SOLANÀCEÆ.

Generic Character.—*Calyx* tubular, ventricose, five-angled, permanent, coarctate (compressed) at top, and two, three, or five-lobed. *Corolla* funnel-shaped, five-folded, five-lobed; lobes cuspidate. *Stamens* five, inclosed, coarctate; anthers conglutinate (adhering). *Stigma* thick, two-lobed, with revolute margins. *Capsule* two-celled, smooth, many-seeded. *Seeds* opaque, reniform, obsoletely trigonal, flat on the sides, and tubercularly wrinkled, a little ribbed on the convex side; testa corky, very thick.—*Don's Gard. and Botany.*

Specific Character. — *Plant* an evergreen shrub. *Branches* lightly covered with ferruginous down. *Leaves* oblong, slightly wavy, clothed with brownish pubescence. *Flowers* in drooping racemes. *Calyx* inflated, nearly the length of the corolla, orange-coloured. *Corolla* small, with reflexed lobes, deep orange.

The old *Brugmansia suaveolens*, formerly called *Datura arborea*, can hardly be unknown to any of our readers. The succulence and rapidity of growth apparent in its branches, and the prodigious numbers in which it develops its gigantic, snowy white, and sweet-scented blossoms, mark it as one of the most magnificent of conservatory plants. More recent, though less valuable, accessions to the genus have been made in *B. sanguinea* and *B. lutea*, both of which are of humbler habits, and produce fewer blossoms, the colours of these corresponding to their name.

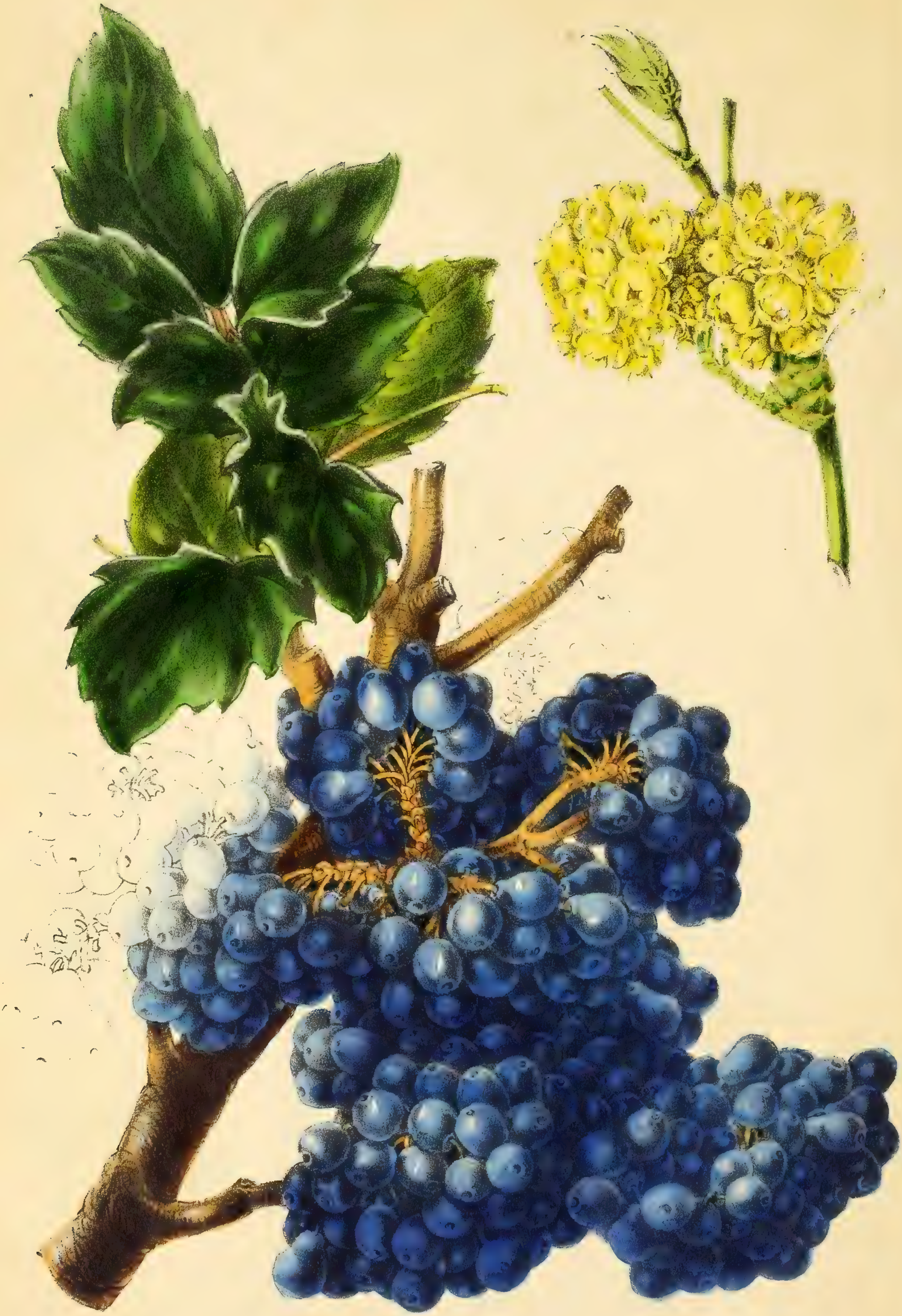
A still further addition has, however, appeared in the nursery of Messrs. Young of Epsom, and differs very materially from the species previously described. It is a small evergreen shrub, seemingly ranging from one to two feet in height, branching freely, having very handsome foliage, and bearing a profusion of deep orange-coloured blossoms, which continue perfect for many weeks. It is remarkable for the smallness of its flowers as compared with those of *B. suaveolens*, and hence it has, we find, obtained the appellation of *B. parviflora*, by which it may be obtained in the Clapton Nursery. But besides this variation in the size of its inflorescence, instead of protruding it singly, as in the allied species, it is collected into a long raceme, comprising six, eight, or more blooms, which open in succession throughout a considerable period. From the last circumstance it has, we presume, received the name of *B. floribunda;* and as we first became acquainted with it under this title, and have no authority for giving precedence to the other, it is here accorded the preference.

Messrs. Young, though doubtful as to the precise district it naturally inhabits, have reason for considering that it is a South American plant. It was brought to their nursery two or three years back, and flowered abundantly in a stove during the months of June and July 1841, having given promise of blooming by forming its buds several months before. What renders the flowers particularly showy is, that the large inflated calyx, which is almost as long as the tube of the corolla, is of a similar and equally rich colour.

The specimen herein referred to was barely a foot high. It had been treated as a stove plant, and potted in a tolerably rich compost of nutritive loam and heath-mould; beyond which it had received no marked attention. In the winter it is placed in a cooler stove; and since it retains its foliage, it has, even then, an ornamental aspect. It is just possible that it will ultimately succeed in a close greenhouse which is kept rather more confined and moist than such structures usually are; and an experiment to determine this would be of great utility to the cultivator. At present we can only recommend a stove of moderate temperature.

Cuttings of the young shoots, placed in sandy soil, under a hand-glass, and assisted by a little bottom-heat, soon form rooted plants. The species, from the slow progress it makes, cannot be very largely increased: nevertheless, this tardiness of growth renders it a most desirable plant for a shelf or stage.

Brugmansia is dedicated to Professor S. J. Brugmans, author of a dissertation on plants.



S. Holden del. & Lith.

Mahonia aquifolium.

MAHÒNIA AQUIFÒLIUM.

(Holly-leaved Mahonia.)

Class.
HEXANDRIA.

Order.
MONOGYNIA.

Natural Order.
BERBERÀCEÆ.

Generic Character.—*Sepals* six, guarded on the outside by three scales. *Petals* six, without glands on the inside. *Stamens* furnished with a tooth on each side at the top of the filament. *Berries* three to nine-seeded.—*Don's Gard. and Botany.*

Specific Character.—*Plant* shrubby, evergreen, growing four or five feet in height. *Leaves* furnished with two or three pairs of leaflets, and an odd one; leaflets ovate, cordate at the base, with spiny teeth on the edges, shining above. *Racemes* nearly erect, much crowded. *Flowers* yellow. *Berries* dark blue.

Of the noble evergreen figured in the opposite page, it may be truly said that a more handsome or ornamental shrub does not exist in British gardens. And we have given this drawing to excite greater attention to its extraordinary merits, as well as to show the extreme beauty of the berries it so liberally produces.

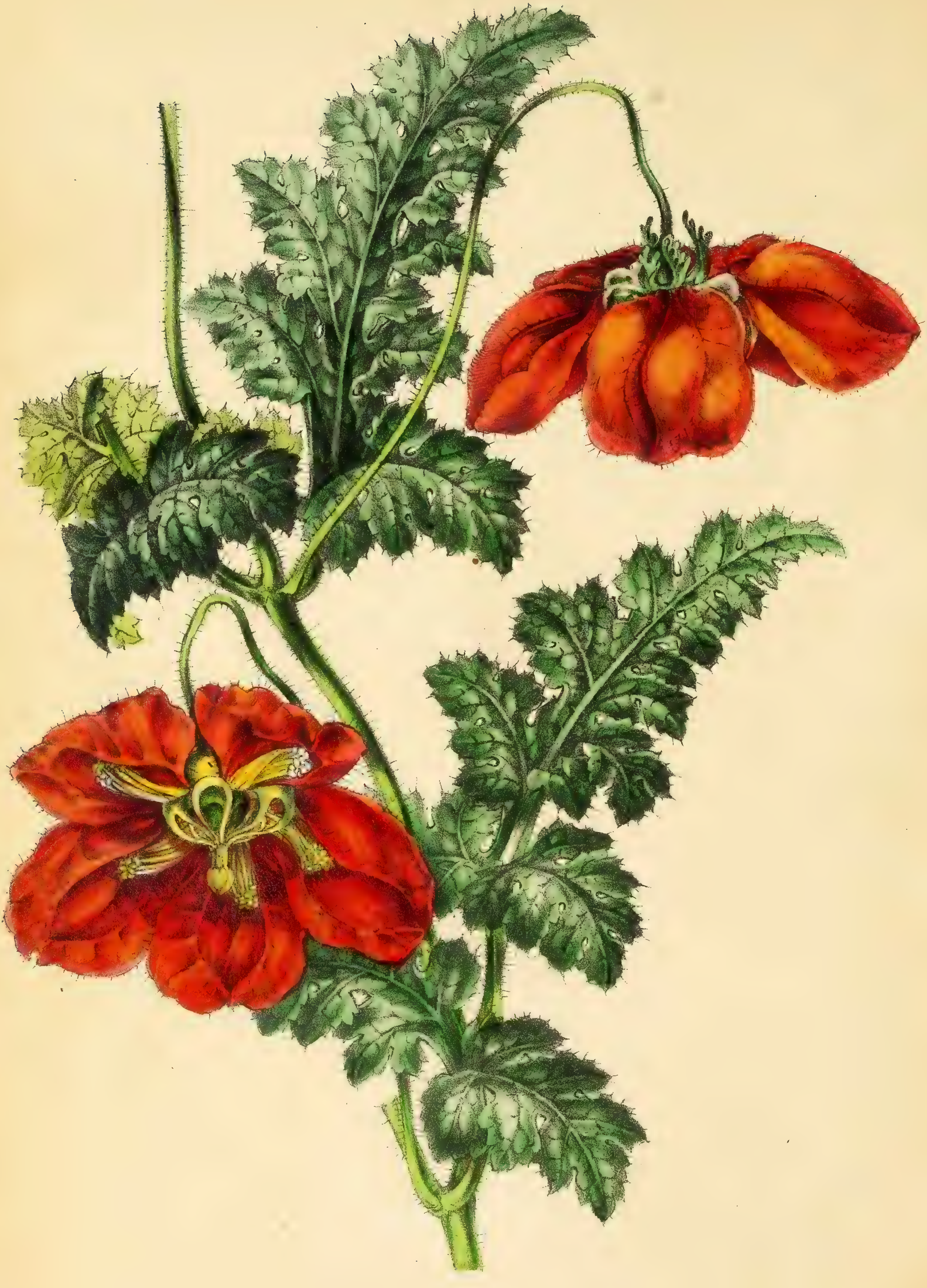
Being an evergreen, and copiously furnished with deep green and glossy leaves, it is adapted for any situation in the most highly-cultured shrubbery. It has even more liveliness in its aspect than the common holly, which it so much resembles in foliage, without any of its rankness and coarseness, and with a decidedly shrubby habit. Added to this, it is perfectly hardy, bears immense quantities of pretty yellow flowers in the earliest part of the spring, and during autumn is covered with fruit which, from its being disposed in clusters, and having the same colour and *bloom*, looks like miniature bunches of grapes.

But while it is so singularly appropriate for placing in borders in a conspicuous position, it is also equally well suited for making an undergrowth to plantations, as it spreads freely over the ground, does not grow higher than four or five feet, and, as we are assured, is not eaten by hares and rabbits, unless they are literally famishing, when it is well known they will destroy any vegetable production.

It is further one of the best plants with which we are acquainted for planting as specimens on lawns, or in turfed recesses by the side of retired walks. Neither exposure nor shade seems to injure it, and its branches or suckers issue from the very base, composing a close pyramid of interesting foliage. Specimens of this character may be seen in the nursery of Messrs. Young, Epsom, nearly five feet in height, and of the most striking beauty. The Epsom Nursery is, indeed, notoriously rich in all kinds of *Mahonia* and *Berberis*, many thousands being raised annually from seed. It was from this establishment that our drawing was procured.

If *M. aquifolium* be cultivated as a border or lawn shrub, or in any open position where it is required to display itself prominently, it is important that the quantity of fruit it is allowed to ripen be limited, by thinning and removing a large portion of it. Where this is not done, the branches bearing the berries become naked and bare, and spoil the symmetry of the bush. In order, however, to enjoy the beauty of the fruit, a small proportion may be left till it reaches maturity; when, as it begins to wither, it can either be gathered and thrown away, or employed for propagation. The seeds are sown in the spring on a bed of light soil prepared for the purpose, and the young plants pricked out in the early autumn, or retained in the seed-bed till the following spring. When about two or three years old, they are in the fittest state for final transplantation.

Mr. Nuttall, an American botanist and traveller, detached this genus from *Berberis*, in honour of Bernard M'Mahon, a lover of botany in North America.



S Holden, del & Lith

Loasa Pentlandica.

LOÀSA PENTLÁNDICA.

(Mr. Pentland's Loasa.)

Class.
POLYADELPHIA.

Order.
POLYANDRIA.

Natural Order.
LOASÀCEÆ.

Generic Character.—*Calyx* five-cleft, with the tube adhering to the ovarium. *Petals* five, cucullate, equal, spreading, inserted in the top of the tube ; scales five, inserted with the petals, furnished with three sterile filaments on the back of each, and girding two subulate appendages inside. *Stamens* indefinite, inserted in the top of the calycine tube, disposed in five bundles opposite the petals; anthers two-celled, bursting inwardly. *Ovarium* joined to the calyx. *Capsule* crowned by the lobes of the calyx, three-valved at the top, one-celled; placentas linear, alternating with the valves. *Seeds* rugged.—*Don's Gard. and Botany.*

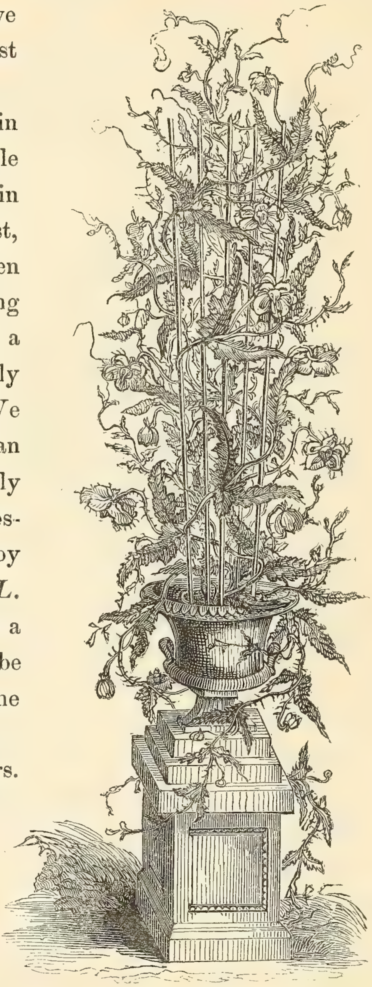
Specific Character.—*Plant* apparently herbaceous, perennial. *Stems* short, disposed to trail, or climb partially. *Leaves* large, with numerous acute lobes, dark green, clothed profusely with stinging bristles. *Flowers* like those of *L. lateritia*, but darker red.

Loasa lateritia, though greatly admired on its first arrival in this country, and very extensively grown for two or three years while it remained a novelty, was not calculated to continue long in popular favour, owing to its straggling nature, the dull green colour of its leaves, and the paleness and diminutiveness of its blossoms in some situations. At this time, therefore, it is reluctantly admitted into many collections ; and, in a few years, will probably be known chiefly from recollection, and from being enrolled in catalogues. Not that it is really unworthy of culture ; for when treated as a summer climber, in the open air, and intertwined with similar plants of tender habits, it is a very pretty object : but it is not one of those plants which will be committed to posterity as a standard and sterling ornament to our gardens.

The present new species, which is of Peruvian origin, while possessing several features which give it a superiority to *L. lateritia*, is not exactly what we should describe as a flower of the first class of beauty. It is, notwithstanding, a showy plant, and has considerable claims to regard. In the hue of its leaves, the size and colour of its flowers, and its less rambling disposition, it is better than *L. lateritia ;* but it wants a greater elegance of growth, which, despite its extreme diffuseness, the latter species manifests in a higher degree.

The unavoidable conclusion from these statements is, that a hybrid between the above two species, uniting the climbing character of the one, in a modified manner, with the more desirable properties of the other, would be all that could be wished ;

and accordingly we learn, from a communication to "The Gardeners' Chronicle" by the Hon. and Rev. W. Herbert, that such a hybrid has been raised, and that the name of *L. Herbertii* has been applied to it. From the description given, it would seem to realize every expectation that could have been entertained concerning it, and will most likely supersede, in time, both its parents.



L. Pentlandica first became familiar to us in the nursery of Messrs. Henderson, Pine-apple Place, where it was grown in a pot and kept in the greenhouse. About the month of June last, however, some plants were placed out in the open border, and, being left to nature, trailed along the ground, matted together, and composed a very beautiful bed. This appears to us decidedly the most congenial way of treating it. We cannot with confidence state whether it is an annual, a biennial, or a perennial. It certainly seems to be at least a biennial, and may possibly prove an evergreen perennial or subshrubby plant. No doubt it can be managed as *L. lateritia*, which is commonly regarded as a biennial, and seeds are saved each summer, to be sown in autumn, and retained in pits through the winter.

We are obliged for our figure to Messrs. Whitley and Osborne, of Fulham; in whose nursery it was taken last August.

It is hardly necessary to add that the species is clothed with strong hairs, which have the stinging property peculiar to the genus. Subjoined is a wood-cut representing its habit as a potted plant.

SCIENCE OF GARDENING.

NO. I.—SEED OF PLANTS.

The practice of impregnating flowers in order to produce varieties, has, of late, been extensively adopted by florists and amateurs; but this is done solely for an object of curiosity or gain, and is rarely investigated philosophically. Were our horticulturists aware of the astonishing phenomena which inevitably attend every process of impregnation, their object would assume another form, and "admiration the superlative of praise" would succeed to vain and unworthy emulation. In the last edition of Lindley's Elements of Botany (1841), p. 56, there is a most beautiful wood-cut, descriptive of the processes of impregnation. We take the liberty to extract a few paragraphs from the letter-press of the same page, to introduce some remarks which offer themselves as a necessary consequence.

"No. 466. *Impregnation* is effected by contact between the pollen and the stigma." We need scarcely observe, that by the term pollen, is to be understood the farina, or dust which escapes from the anthers of a flower, when its valves burst open. The stigma is the point or termination of the pistillum, pointal, or female organ, which secretes a viscid juice, discernible under a lens of moderate power, and frequently by the unassisted eye. Whether the stigma be furnished with such juice, or with a velvety pubescence, or whatever be the nature of its peculiarly appropriate surface, certain it is, that, according to the most accurate observation, this organ is the only portion of a perfect vegetable which is not invested with cuticle or epidermis.

"467. The pollen emits a tube of extreme delicacy, which pierces the stigma and style, and, passing downwards into the ovary, enters the foramen of the ovule."

This theory is acute, yet must be received with caution, for who, and what instrument can detect a tube of such tenuity? The most powerful microscope that ever came from the hands of that skilful optician, Ross, would, we conceive, be utterly inefficient. Let any one investigate the farina of the mallow by one of his botanical microscopes, and he will perceive a congeries of elegant spherules armed with hair-like points; each grain is said to contain a fluid, in which *float grains of starch and drops of oil.* But where, then, are the tubes? The eye cannot discover them, nor any trace of such infinitely minute threads in the pollen of the mallow; which yet is one of the largest varieties that we are acquainted with.

It would, we think, be more safe to refer the phenomena of impregnation to the absorption (by attraction between fluids of different density) of a subtile fluid contained in each pollen grain, and its transmission through the channel of the style, to the ovule.

"468. Having reached the *foramen*, it comes into contact with the nucleus."

The foramen is the little orifice which is visible in some seeds, and to it the future radicle is directed. The *nucleus* encloses the embryo which, when impregnated, becomes the vital point—the future plant, surrounded by integuments that, in the ripe seed, consist, as the case may be, of gluten, albumen, and starch. During the process of maturation, the ovule is attached to the ovary or seed-vessel, by a substance called the placenta ; a cellular mass, which connects the vitalized embryo with the fluids of the plant.

We are not inquiring into the botanical structure of seeds (impregnated ovules), or of seed-vessels (pericarps) ; our object is to ascertain, so far as the intricacy of the subject may permit, the simple phenomena of germination and vegetation.

Yet in order to fix in the mind a definite object, we will presume the case of a Pelargonium, crossed by another plant of the same genus, for the purpose of obtaining a variety. Gardeners know well, that although the curled stigma of the one be dusted over its five revolutions with farina, one only of its seeds usually swells and becomes fertile ; thus offering conclusive evidence that a single ovule or seminal rudiment has been excited by the fertilizing tube, or essence of the farina.

It has been a question with physiologists, by which of the two parents the offspring is most influenced : we lean to the opinion that, as the unimpregnated ovule and its nucleus will inevitably dwindle and collapse ; and as by contact with the pollen the embryo becomes vitalized, its nucleus organized, and its fluids converted into solid appendages, " the *aura*," or whatever else the subtile agent may be that effects impregnation, *must be the parent* ; and as such, the *rudimental image of the future variety* ; which, however, as it is fed by the fluids of the female, becomes more or less modified according to existing circumstances.

Of the *phenomena of germination*, we perceive the most open and ready solution in the processes of malting. Barley is, by analysis, found to consist of—

Gluten	3 parts
Sugar	4 "
Gum	5 "
Starch	88 "
	100

Gluten is an azotised substance, and its elements appear to be—

Carbon	55.7
Hydrogen	7.8
Oxygen	22.9
Azote	14.6
	100

Now, it is asserted that " a seed " contains a greater proportion of carbon than enters into any other of the vegetable products. If this be true, grains and seeds owe their excess of carbon to the gluten which they contain. And again ; if it be required as a condition of growth, that the excess of carbon be removed and disappear, we have to look for an agent which shall be found invariably to produce that effect.

It has been shown that a small quantity of gluten is capable to convert a large quantity of starch into sugar. "The gluten of barley is an important agent in the change which that grain suffers during conversion into malt, and the action of ground malt upon viscid starch is analogous to that of gluten."

But sugar contains only about forty-two parts per cent. of carbon; and as sugar and mucilage are formed by the decomposition of gluten during germination,—thirteen per cent. of carbon having disappeared,—it is reasonable to conclude that the gluten is the constituent to which seeds owe their excess of carbon.

When barley, after being steeped forty hours in cold water, is thrown out of the cistern upon the floor, it is formed into a heap or couch sixteen inches deep; it thus remains more than twenty-four hours, and is turned and spread abroad thinner several times. The wetted mass acquires a few degrees of heat, because water is decomposed; and a volume of disturbing electricity is liberated, which acts upon all the elements according to their individual capacities; attractions are excited, carbon disappears, roots gradually develop and elongate with great rapidity; and in a few hours more, the *acrospire*, or plumule, issues from the opposite end of the grain.

Malting, as an electro-chemical phenomenon, is now complete, and the results, according to Dr. Thomson, are—

Gluten	1	compared with raw	barley—	loss	2
Sugar	16	,,	,,	excess	12
Gum	14	,,	,,	idem	9
Starch	69	,,	,,	loss	19
	100				

Thus, every condition is fulfilled; vegetation is established, and carbon is removed—partly, perhaps, in the form of carbonic acid, but chiefly during the development of roots, of the ligneous fibre of which it becomes the basic element.

We have stated that gluten contains nearly fifty-six per cent. of carbon. In sugar and gum the proportion is about forty-two per cent., and the highest estimate in starch little exceeds forty-four per cent. The excess of carbon must, therefore, be ascribed to the presence of gluten; but the disturbing power is to be sought in the agency of water.

In the cistern and couch, the progress and developments of malting become manifest: in the ground they are hidden, but analogy interprets the phenomena; and we may safely ascribe the germination of a seed, first, to the enormous volume of electricity which is liberated during the decomposition of a single grain of water (see *Faraday's New Researches*); and secondly, to the play of chemical affinities, by which organic components of a ripe seed are thus disturbed, and enter into new vital combinations, according to the constitution of each individual.

CULTURE OF GESNERA RUPESTRIS.

Gesnera rupestris, a most elegant little species, and entirely unique among its congeners, is a plant that is little known to cultivators, but certainly has charms which should introduce it to more general esteem. As usually witnessed, it has one, two, or perhaps three large leaves, and a few tufts of flowers; but owing to the indiscreet manner in which it is grown, (or rather neglected,) it is only here and there brought to that perfection which it is capable of attaining. Having previously seen it in no other condition than that above described, we were no less astonished than delighted to observe it lately, in a celebrated Kent collection, with as many as forty or fifty leaves, and a proportionate number of blossoms. The circumstances which appear to have caused this superiority are mainly as follows.

In the majority of stoves where it is at all cultivated, we have noticed that it is kept in a very small pot, not more than an inch or two larger in diameter than the great fleshy tuber of the plant itself; and thus it remains, year after year, in a poor soil, and without any attention beyond the needful variation in its supplies of water. The tuber, moreover, is allowed to be a quarter or half an inch above the earth in the pot, and by this exposure continues yearly to increase in size, at a rapid rate, but expends scarcely any of its strength in the production of leaves and inflorescence, in consequence of the tuber itself, by being open to the atmosphere, performing a great part of the functions which ought to be fulfilled by the more ordinary external developments.

Now, as it is ascertained that every plant requires that a certain quantity of surface should be presented to the direct action of the atmosphere in proportion to the abundance of its roots, it will be obvious that the immediate contact of so large a mass of tuber with the air must check materially the expansion of the usual exterior organs, and this, again, will operate to the restricted extension of the roots; thus bringing about a general stuntedness and debility, at least so long as the practice is continued.

To effect an improvement on such a state of things, the mode of proceeding can hardly be mistaken, and its results are in the highest degree satisfactory. All that needs be done is to cover the tuber lightly—very lightly—with soil, use a more nutritive compost, and, at the same time, place the plant in a much larger pot, to admit of the additional protrusion of roots which will assuredly follow the augmented development of foliage. In two years, a specimen will thus altogether change its character in the manner we have shown, and exhibit a copious tuft of healthy leaves, beautifully interspersed with clusters of pretty red blossoms. So well covered, indeed, was the specimen to which we have referred, that, in a diameter of nearly eighteen inches, it could not be discerned whence the leaves and flowers issued.

The principles incidentally alluded to in these remarks on a particular plant, are of recognised application to the majority of bulbs, which, as all are aware, never grow so freely unless the upper portion be just buried beneath the earth. As, however, planting them too deeply would have a very bad effect, by rendering them unprolific of blossoms, the safest practice is to leave the tip of the crown exposed or close to the surface. In their more artificial culture, the evils of either extreme are much aggravated; which leads us to explain that all Gesneraceous plants, with tuberous roots, are governed by an analogous law, and that by letting their top surface remain uncovered, (as is the custom in some gardens,) the quantity of their stems and flowers is invariably diminished, or these are sensibly weakened. Our attention has been repeatedly arrested by two specimens of *Gesnera* with equally large tubers, the one having one or two feeble flowering stems, and the other five or six vigorous ones, though treated exactly alike, with the exception of the tuber of the former being placed far higher in the pot. The happy medium is, unquestionably, that which we have indicated in speaking of bulbs.

It would be improper to pass from this subject without adding that, where the object is to enlarge the size of the tuber, and to accumulate therein resources for a future period of peculiar luxuriance or splendour—sacrificing two or three years' beauty to the accomplishment of this end—no means are more likely to promote it than those we have above condemned in the cases where actual and immediate effect was desired.

ON ARRANGING AND PLANTING SPECIMENS IN CONSERVATORIES.

A CONSERVATORY, properly speaking, is either a greenhouse or stove, and simply a building devoted to the preservation and culture of exotic vegetation, without any regard to the temperature at which it is maintained. But in the language of gardeners and floriculturists generally, the term has a far more exclusive application; and is employed to designate those structures which are kept at about the same average heat as a greenhouse, while they are rather larger than ordinary greenhouses, and are composed, internally, of beds and borders, in which the principal part of the specimens intended to be grown are planted.

To the last definition we propose adhering in the remarks now to be offered. It is of no inconsiderable moment in horticulture, as in every other science, that the phrases in common use should be explicit, and bear one universal meaning; and we do not know how the word conservatory can be better applied (considering the established signification of the term greenhouse) than in denominating the edifices in which plants are cultivated in the natural manner—*i e.*, in a comparatively unlimited mass or body of earth; discarding altogether its reference to such buildings as are merely of large proportions, unless, as is usually the case, they contain similar facilities for planting out the specimens.

With this restricted sense of the name, we would include likewise some slight peculiarity of treatment which should further distinguish them from greenhouses. It will be conceded by most cultivators that the farther we depart from the natural routine of management, the more necessary does it become to adopt artificial means of obviating injury from that course; and, on the other hand, as we advance towards the system of Nature in our modes of treatment, the lesser points of attention which were essential in the former state, may be disregarded with perfect impunity.

Thus, in the conservatories of which we speak, it will not only be safe, but desirable, that a smaller amount of air should be introduced; the atmosphere being retained, during summer, in a warmer and moister condition than can ever be allowed in greenhouses. That such a change would benefit the plants, every experienced practitioner will affirm. But in greenhouses the great difficulty lies in effecting it, without, at the same time, carrying it to an extreme, and realizing the peculiarities of a stove.

In greenhouses, as usually constructed, the power of filling the air with moisture, even to a modified degree, is exceedingly circumscribed, and entails the constant exertion of the attendant; there being no surface capable of at once holding and exhaling sufficient vapour throughout the whole day. Wanting this, it is impossible to augment the heat, or allow it to rise materially, and not cause some of the plants to suffer from extreme aridity, even supposing the most careful and continuous efforts to be made for supplying water; while it is almost equally impracticable to increase, by contrivances for transmitting additional light through the roof, the action of this powerful element on the plants, since, under the more energetic influence of light, there is a still greater demand for fluid to make good the extra evaporation it produces.

These advantages, however, would not be felt in conservatories of the class we are describing; and the alteration in their general management which we would suggest, is that they be kept rather closer than greenhouses in summer, by ventilating them less; and that, by liberally watering the beds of earth each morning, and again occasionally during the day, if needful, the atmosphere be always maintained in a state intermediate between dryness and saturation, never approaching too closely to the aridity of the greenhouse, nor to the humidity of a damp stove.

The superiority of conservatory culture over that of greenhouse treatment in pots, must be strongly manifest; at least, where the specimens are not wished to be removable. More vigorous and healthy growth is one of the highest benefits derivable from the plan. This is due to the greater quantity of light which can be brought to act on them, for plants whose roots are unconfined (with the exception of a few sorts) are invariably improved by light. Another circumstance which contributes mainly to the result, is the absence of all the vicissitudes to which plants in pots are subjected, such as superfluous or scanty allowances of water; the burning action of the sun on their roots, through the medium of the sides of the pots; and either checks for want of pot-room, or disease from the repletion induced by being placed in too large a receptacle. However paradoxical it may seem to say that specimens which are much overpotted, are far more exposed to detriment than such as are planted in a spacious border of earth, it is notorious that the latter, by the superior energy they derive, and by the rareness with which water accumulates prejudicially in large masses of drained earth, easily dispose of all the fluid around them, and are scarcely ever found in what is called the "sour" soil so common in pots.

When it is remembered, too, how useful a moist atmosphere is to growing plants, it will be perceived, that the provision of extensive beds of earth is the best means of affording this, inasmuch as they permit the most constant and regular exhalations. As a final advantage attending the transplantation of specimens in conservatories, we may just allude to the saving of labour and actual expense it occasions. After the first preparation and filling of the beds, watering will occupy far less time, and be demanded much less frequently than if the plants were in pots, while the subsequent trouble of potting and the cost of new pots will be entirely dispensed with.

With such recommendations, it would be singular that the method is not more commonly practised, were it not that the number of gross errors mostly committed in its adoption so counteract and nullify its obvious advantages, that persons are loth to follow it on account of the slovenly appearance usually presented by existing conservatories thus planted. The wildness and disorder, however, which are ordinarily met with in planted conservatories, are by no means necessary consequences of the system. They rather arise from the mistakes which are made by those on whom the furnishing and after-management of such structures devolves.

As defects can hardly be remedied until they are shown to be such, and their injurious tendencies are made thoroughly and convincingly apparent, we will now explain why conservatories are not the orderly and attractive houses which they might be.

Cultivators are far from being sufficiently alive to the necessity for regulating properly the quantity, quality, and position of the soil placed in the beds of conservatories. Assuming that drainage is never neglected, and that a good sub-stratum of some hard or stony material is deposited beneath the earth, the depth of the latter is often a matter of indifference, and from two to three feet, and sometimes more, is thought to be essential. Now one grand object of the cultivator of exotics should be to keep the roots near the surface; otherwise an undesirable and inconvenient exuberance of growth, and a deficiency of flowers, is certain to ensue. They who seek to know why some species obtain so great a height, and straggle so clumsily over the more valuable kinds, will find a partial answer in the depth of soil which is allowed to them. Eighteen inches, or two feet at the utmost, is, in our view, quite enough of earth for all but the stronger trees which come beneath the appellation of greenhouse plants, and these are for the most part unfit for culture.

The quality of a compost is, perhaps, more influential than its depth. Acting on some ridiculous principle, which we have always been unable to discover, the transplanter of exotics gives his plants a more nutritive earth when their roots have nothing to check them than when they are confined by a pot. A proceeding directly the reverse of this, would be far more consonant with reason; for the luxuriance which a plant naturally attains on being transferred to an unencumbered bed of soil requires repressing instead of encouraging. We therefore advise that a poorer earth be used in conservatories than that given to the same species while in pots.

Regarding what we have called the position of the soil in borders, we may observe, that we mean the height of its surface relatively to that of the walks. In making beds or borders, the compost being put in lightly, subsequently sinks two or three inches if there is a considerable body of it. Cases of this description have occurred within our knowledge, in which, after the earth has duly settled, it is on a level with, or even lower than, the paths. To do away with its disagreeable appearance, (for nothing looks much worse than a border below the general level,) and also, as was fancied, to render the soil drier, a coating of two or three inches of fresh earth was applied, and thus the roots were buried a proportionate distance beneath the surface. All are aware of the bad effects of planting tender plants too deeply; and consequently a border should ever be made sufficiently high at first to admit of its sinking to the estimated amount, and then remaining fully three or four inches above the walk.

The fallacy of placing new soil on a plot in order to guard the plants it already contains against a superfluity of water, would not need exposing were the expedient not sometimes resorted to. It may be done with the avowed end of rendering the border drier; but, of course, the state of the border is of no consequence beyond the manner in which it affects the plants growing in it. Other motives may be improved appearance, or the imaginary benefit of the plants, by having a new and more nutritive soil; but in all cases it operates most harmfully on the specimens, by making the earth about them really much wetter, and removing their roots from the indispensable influence of the atmosphere. If, then, it be needful to raise the bed, the plants should be equally and simultaneously elevated, so that their roots may be spread out near the top.

An evil of yet greater magnitude than proceeds from inattention to the soil, attends a want of proper forethought in the selection of species and specimens fit for planting. In instances without number, the contents of a conservatory depend wholly on the plants which the proprietor happens to possess at the period of planting, or which his friends or neighbours can readily spare. All the large specimens that have become too lofty or too rambling for other houses, are taken at once to the conservatory, where, it is unnecessary to add, they soon smother the smaller and better plants. Or the filling of the structure is confided to a nurseryman, who naturally sends his most unwieldy plants, not merely from a desire to get rid of them, but because a notion seems to prevail that the larger the specimens, the sooner will a good effect be produced.

Species, again, that are in themselves beautiful, and bear a profusion of blossoms, are often, when a choice is really made, fixed upon without considering their habits, or to what height they will grow ; and the whole are planted heterogeneously, and more with respect to their size at the time, than to that they will eventually reach.

One uniform result is experienced from all these bad practices. In a few years from the time of forming a collection, two or three of the stronger and more rampant sorts have outstripped the rest, and occupy of themselves the whole of the space which ought to have been covered with the greatest possible variety. Rare or weakly specimens, which are mostly of the highest value, unable to struggle with their luxuriant neighbours, are suppressed, and finally perish.

Our mode of planting a conservatory would be widely different from the foregoing. We would choose those species which are of a shrubby character, and which rarely grow higher than six or eight feet ; though the majority should be even smaller. Arranging them with reference to their known habits, the tallest-growing should undoubtedly be placed in the centre of the bed, or the back of the border, with an occasional deviation to create variety. And for specimens, we would prefer young and small plants, unless they had been kept dwarf and compact, avoiding all that are diffuse, or have long bare stems, as no after pruning will suffice to reduce them to the desired symmetry and regularity.

Notwithstanding, however, all the care that may be bestowed on the preparation of soil and the choice of plants, it is found that something is lacking in order to confine each specimen within its appropriate limits, and to enable the culturist to give to each the soil, water, &c., it individually demands. To fill up this deficiency, a friend of great experience has favoured us with an outline of a plan which is as simple as it is effectual, and which he has seen executed with the most gratifying success. It consists in dividing the compartment to be planted into numerous distinct pieces of a square figure, and apportioning each of these in size to the capacity of the plant destined to fill it ; leaving a larger space than would seem necessary for a small plant, if by that means its growth can be promoted, and contracting the spot apparently indispensable for a vigorous species, that its disposition to luxuriate may be restrained. Around all these divisions an impenetrable wall is to be made ; and it is immaterial whether bricks, thin stone, slate, or any other substance be used for the purpose, so long as it is hard enough to repel the roots, and tolerably durable. By this means, weakly but ornamental plants can be assisted, and the stronger kinds kept in due bounds ; each can have the sort of soil and the quantity of it that it is presumed to need ; an independent system of drainage may be formed for all ; and watering can be conducted with the most complete discrimination. The plan is, on the whole, one of the most valuable we have ever had the opportunity of publishing. It destroys entirely every objection to the planting of exotics in beds; and a very slight superficial layer of earth will conceal all the partition walls, and leave the same unbroken surface which is a concomitant of the old system.

To bring plants in conservatories to the perfection of which they are susceptible, and render each a handsome as well as prolific specimen, it will be important that their young branches should be pruned or stopped for the first two or three years, which will both give them a bushy character, and make them far more productive of blossoms. The practice may, indeed, be continued throughout their entire growth when it is thought advisable.

It would take up too much of our room to add a list of the plants most suitable for the purpose herein discussed. In the genera *Chorozema*, *Hovea*, *Pimelea*, *Erica*, *Azalea*, *Camellia*, *Rhododendron*, *Brugmansia*, *Acacia*, *Luculia*, *Enkianthus*, *Leonotis*, *Fuchsia*, *Eriostemon*, *Eutaxia*, and very many besides, species of great beauty, and of a remarkable diversity of aspect, may be met with. And if any of the taller of them should, in spite of the restraints already hinted at, exhibit too unconquerable a propensity to rise or spread and injure the remainder, we would advise their immediate eradication, supplanting them by species of more moderate tendencies. It is solely by thus removing ungainly specimens before they have had time to hurt the choicer ones, that the beauty of a collection can be established.

PROPAGATION OF TROPÆOLUM TRICOLORUM.

Few plants have held a longer or more decided sway over public esteem than *Tropæolum tricolorum*. The peculiar elegance of its growth, and the extraordinary prodigality with which it develops its beautiful tricoloured blossoms, have always given it attractions which every person professes himself an admirer of, and which will most likely afford pleasure as long as any of the plants at present noted for beauty are cultivated.

Singularly enough, however, this pretty species, though introduced thirteen or fourteen years ago, has never become absolutely common; and its price in nurseries yet ranges too high for amateurs in a small way to be general purchasers of it. We have very seldom seen it in window cultivation, never among a cottager's plants, rarely in those gardens where nothing but a small greenhouse is kept, and in the best places usually no more than two or three specimens.

This scarcity, or, at least, far from general possession, of a plant which must stand high in universal favour, is assignable to no conceivable cause but the uncertainty with which it can be propagated. The common mode of increasing it by cuttings is exceedingly liable to failure, from the very tender and succulent nature of the young shoots necessarily employed in that way. Even with the greatest precaution and the most vigilant attention, it is impossible to avoid the loss, by dampness, of a large proportion of the cuttings put in at any season; while many are reluctant to mutilate their plants in order to obtain a fresh supply. It is not asserted that, in particular cases, by planting the cuttings in almost pure sand, during the spring months, and tending them sedulously to preserve them from the earliest inroads of excessive moisture, complete success has not been realised. But that this is not an ordinary occurrence, is demonstrated in nearly every establishment throughout the kingdom.

Besides the method of multiplication from cuttings, such an abundance of seed is produced by strong specimens, and ripens so thoroughly in fine seasons, that many have been induced to try its increase in that way. We have heard, on this head, numberless complaints that the seed will not germinate, and hence this plan, though so palpably natural, has had to be abandoned.

A few months back, we had communicated to us, through an ingenious friend, a process by which the seeds of this plant may be readily made to vegetate; and as we think it likely to effect that increased diffusion of the species which appears so very desirable, we have made it the subject of the present paper.

The skin, rind, or integument of the seeds of *Tropæolum tricolorum* is so hard and tough, that either the requisite stimulants cannot reach the seat of vitality, or the power of vegetation is insufficient to burst the bands by which the integument confines it. To release it from this encumbrance, the easy process of taking off entirely its outer covering has been performed; and after this, the seeds are found to germinate in a very short period. Thus, by a system so trifling that it is hardly worth recording, a most delightful plant may be perpetuated to any extent; care in detaching the rind of the seed being the only pre-requisite. Perhaps, preparatory to divesting it of its skin, a short steeping in lukewarm water will tend to secure the internal part from injury.

Without doubt, the plan thus sketched is capable of a similar application to *T. pentaphyllum* and other species. We know it to be effectual with *T. peregrinum*, which, so treated, may be raised during May in the open ground, wherever it is required as a summer ornament. Indeed, there are no seeds whose size admits of their being thus stripped, and which remain in the ground for a lengthened period without vegetating, that we would not subject to the operation; as it is more simple and efficacious than the employment of any chemical agents.

FLORICULTURAL NOTICES.

NEW AND BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR DECEMBER AND JANUARY.

Achime'nes ro'sea. The name *Achimenes* was given primarily by Dr. Patrick Browne to two species, one of which (since called *Trevirania coccinea*) has long been common in our gardens. The priority of application of the original name has led to its being restored. *A. rosea* is something like *A. coccinea,* but has rich rosy flowers, spotted in the centre ; and "the peduncles are more slender, with more spreading hairs, and a general tendency to branch. The proportion, too, between the limb and the tube of the corolla seems materially different, and the leaves are covered with elevated asperities, on each of which a hair is placed. Mr. Hartweg found it in Guatemala, and sent roots of it to the Horticultural Society ;" in whose garden, at Chiswick, it flowered for several months during last autumn. *Bot. Reg.* 65.

Aquile'gia Skinne'ri. Described as one of the finest species of *Aquilegia* at present known. It was transmitted to Woburn Abbey, the seat of his Grace the Duke of Bedford, by G. U. Skinner, Esq., from Guatemala, and is remarkable as coming from a more southerly district than any other American Columbine. It is, nevertheless, entirely hardy, having "survived the severe winter of 1840-41 in the open ground at Woburn, and flowered in great beauty through the summer and autumn of 1841." The flowers have greenish petals ; but the sepals of the calyx are prolonged into large spurs, which are of a brilliant red colour. It will doubtless prove a very handsome acquisition to our flower-borders. *Bot. Mag.* 3919.

Ca'ttleya granulo'sa. An exceedingly scarce species, of which only one small specimen exists in the gardens of the Horticultural Society, to which it was forwarded by Mr. Hartweg, from Guatemala. It has a slender stem, with two terminal narrow leaves, resembling those of *C. bicolor.* But a single flower has yet been produced, which has olive-coloured sepals and petals, mottled with brown, and a whitish lip, which is beautifully spotted with orange and pink in the inside. The middle lobe of the lip "has its surface broken up into numerous granulations." It demands quite a low temperature, compared with the Dendrobiæ and other tribes. *Bot. Reg.* 1.

Dendro'bium di'scolor. The species so named, although from Java, is found by Dr. Lindley to be the same as *D. undulatum,* met with by "Dr. Brown, on the north coast of New Holland, and before him by Sir Joseph Banks in the same country." It must consequently be henceforth called *D. undulatum.*

Glossoco'mia ova'ta. *Glossocomia* is a genus separated from *Campanula ;* and the present species is a "pretty hardy perennial, with spindle-shaped roots." It is not inclined to twine, like *G. lurida,* "seldom growing more than one foot and a half high. It flourishes well in any good garden soil, and flowers in July. It is easily increased from seeds, treated like those of *Campanula carpatica,* and the more slender species of that genus." The flowers are bell-shaped, solitary, terminal, pendulous, and of a purplish-white tint, with darker streaks radiating from the centre. *Bot. Reg.* 3.

Houlle'tia vitta'ta. Received by Messrs. Loddiges from Mr. Schomburgk. Its habit is like that of *Maxillaria Warreana,* but not so strong, and the flowers are singularly striped with brown on a yellowish ground. "At the base of the hypochilium (or lower part of the lip) is a downy tubercle, which projects towards a small three-toothed plate, which is directed backwards from the base of the metachilium. The latter has two falcate lobes, which curve forwards, and have in the recess formed by their junction a triangular fleshy tooth. The epichilium (or upper extremity of the lip) is lozenge-shaped, and rounded at the point." *Bot. Reg.* 69.

Lysima'chia lobelioi'des. Although found by Dr. Wallich's agents in Nepal and other districts of Northern India in 1821, this plant has only lately been introduced to England by the Hon. Court of the East India Company, who presented seeds to the Horticultural Society. "It is a hardy perennial, well adapted for rockwork, and similar purposes ; for although its flowers are simple and unattractive, they are very sweet-scented, and the foliage is neat, while the general growth of the plant is close but graceful. In a good season it would ripen seeds abundantly."

The plant is easily cultivated in the common earth of gardens, and flowers during the months from July to October, inclusive. "It is increased by seeds, but the seedlings will not flower before the second season; also by dividing the old plants in the autumn." *Bot. Reg.* 6.

NELU'MBIUM SPECIO'SUM; *var.* A magnificent rose-coloured variety of this splendid aquatic, which flowered in the collection of his Grace the Duke of Northumberland, at Syon, in July and August 1841, and the blossoms of which were succeeded by fruit, which promised to arrive at maturity. The extraordinary luxuriance which the plant had attained is attributed to its being grown in a damp stove, and to the water being frequently changed. Its leaves are of an enormous size, and the flowers appear to be at least a foot across, with a colour of the deepest, richest, and yet the most varied pink or rose tint. It is a native of the East Indies, and admirably fitted for large stove aquariums. *Bot. Mag.* 3916.

OTOCHI'LUS FU'SCA. This is a singular little epiphyte, with pseudo-bulbs arranged along an ascending rhizoma like some kinds of *Maxillaria.* From the base of the younger bulbs the racemes of flowers protrude considerably, and then depend gracefully, bearing a number of pretty whitish flowers which have a deep pink horn-like column. It inhabits trunks of trees in Nepal, and was introduced by Dr. Wallich. It bloomed in Glasgow Botanic Garden in February 1841. *Bot. Mag.* 3921.

PODOTHE'CA GNAPHALIOI'DES. A Swan River annual, with flowers of a syngenesious character, and the common yellow hue; but, at the same time, a particularly interesting and ornamental plant. It has the habit of *Rhodanthe*, and the colour of the small star-like florets is very rich; while, by being collected into dense heads, and inclosed in a pale chaffy involucre, they have a good effect. It was "raised at the nursery of Messrs. Dickson and Sons, Edinburgh, in the spring of 1841, from a collection of Swan River seeds, communicated the year before by Mr. Murray, Lintrose. It flowered abundantly in July and August, but ripened no seed." Young plants have, however, been obtained from cuttings. We have also seen it at Messrs. Young's, Epsom. *Bot. Mag.* 3920.

RIGIDE'LLA IMMACULA'TA. The bulbs of this pretty plant were sent to the Horticultural Society from Guatemala by Mr. Hartweg. "It differs from the original species (*R. flammea*) in having much smaller flowers, not spotted, and narrower leaves; otherwise they are nearly the same, except that this is the more slender and dwarf of the two." It is an extremely interesting species, with bright red flowers, which have the same peculiarities of rising and drooping in certain stages as those of *R. flammea.* Its treatment is like that of *Tigridia.* *Bot. Reg.* 68.

STYLI'DIUM RECU'RVUM. "I first saw this species," says Dr. Graham, "in the nursery of Mr. Cunningham, Comely Bank, Edinburgh, where it flowered in a frame in May 1840." It was afterwards received from Messrs. Henderson, Pine-apple Place, and Mr. Jackson of Kingston. Its native habitat is the neighbourhood of Swan River, Australia. Apparently it is a pretty plant, with stems six inches high, suffruticose, branching in tufts. The leaves are numerous, disposed all along the branches, but crowded into a stellate form at the summits, awl-shaped, arched backwards, and with "a membranous colourless ragged border on each side near the base." The flowers are pink, with a yellow border, and a recurved lip. *Bot. Mag.* 3913.

NEW OR BEAUTIFUL PLANTS NOW OR LATELY IN FLOWER AT THE PRINCIPAL SUBURBAN NURSERIES.

CŒLO'GYNE FULIGINO'SA. A handsome species, not much unlike *C. barbata*, but very considerably larger in all its parts. The flowers are of the same dull cream colour, and beautifully glittering and transparent, with a lip richly blotched and striped with dark brown, delicately fimbriated at the edges. It is quite as profuse a blooming plant as *C. barbata*, and, as in that species, the blossoms are produced throughout several months of the year. Messrs. Loddiges have it now in flower.

CORRÆ'A LINDLEYA'NA. One of the very numerous hybrids which have lately been raised, and apparently identical with what was once called *C. Stockwelliana.* Its present name was given, we believe, in compliment to Dr. Lindley. It is a very pretty variety, remarkable for the denseness of its branches and foliage, which form quite a little thicket impervious to the sight. The flowers are pale crimson, of a moderate size, and abundant. Specimens are blooming most prodigally in the nursery of Mr. Knight, Chelsea.

DENDRO'BIUM AU'REUM; *var.* PA'LLIDUM. This charming variety cannot be made too generally known. It blooms two or three weeks before the old species, and has light cream-coloured sepals and petals, with a lip which has a broad band of orange down the centre. Its scent is fully equal to that of the richest violets; and the atmosphere around it is loaded with its fragrance in the evening of the day. Messrs. Loddiges are flowering it finely; and *D. aureum* is developing its buds by its side.

DENDRO'BIUM DENU'DANS. Allied to *D. alpestre,* which it closely resembles in the structure and hues of its flowers. The stems are, however, much longer, and curve downwards so as to assume a pendent position. Several racemes of flowers issue from the same stem, and a specimen of tolerable size has a pretty effect when in full flower. The blossoms last two or three months, and though small and simple, are exceedingly elegant. Messrs. Rollisson possess good blooming specimens, on which the flowers have been opened since November.

DENDRO'BIUM NO'BILE. A gigantic plant of this lovely species is at present blossoming in the richest perfection with Messrs. Loddiges. Even the stems almost defy any effort to count them, and the flowers are proportionately numerous. Being an old specimen, the stems are covered with short branching shoots, from the base of which innumerable white roots hang down, to the length of one or two feet; and as these have twisted themselves into a variety of directions, the whole has a most singular appearance. From the state of this plant, it is obvious that old specimens flower most liberally, on account of the flowers issuing, for the most part, from the first and leafless stems; yet it is equally clear, by a comparison with younger plants, that the latter bear the largest flowers. *D. cœrulescens,* which is blooming in close proximity to *D. nobile,* is easily distinguishable by its thinner and less vigorous stems, narrower sepals and petals, pointed lip, and a dash of blue or purple in the colour of its blotches. Both are amongst the best of the tribe.

E'PACRIS, *hybrid.* Messrs. Henderson, of Pine-apple Place, have recently obtained or raised a large number of seedling *Epacris,* some of which are improvements on *E. campanulata* and *E. variabilis*; but the most distinct variety is one after the manner of *E. grandiflora,* with rather shorter flowers, and of a pinkish tint, which merges into pale blush or white at the expanding extremity of the tube. This is a desirable kind, and will undoubtedly be increased.

EPIDE'NDRUM SKINNE'RI. An invaluable species to the cultivator of Orchidaceæ, from the great length of time its blossoms continue unfolded, and their lively pink hue. Two spikes of flowers in a plant at Messrs. Rollisson's, Tooting, each comprising twelve or more blooms, have been in perfection since the beginning of November, and though now, on near inspection, they seem slightly withered, and have lost some of their delicacy, they look, at a little distance, as fresh as ever, and their colours have faded in the most trifling degree. A very dark-blossomed variety has likewise been flowered by Messrs. Rollisson, and it may probably be found a distinct species.

LEPTO'TES CO'NCOLOR. Distinct from *L. bicolor* in being altogether smaller, and in having less colour to its lip; though hardly to be deemed inferior in regard to beauty. It has thin and almost cylindrical leaves, with a furrow down the inner side; and the flowers arise singly from the point at which the leaves are joined to the stems. The blossoms are white, and the labellum, too, is chiefly white, but does not precisely answer to the name; for it is stained with purple at the base. Messrs. Loddiges, who grow it on a block of wood, have a plant on which at least a dozen flowers are opened at once.

LUCU'LIA GRATI'SSIMA. The splendour in which this noble plant bloomed at Messrs. Henderson's, Pine-apple Place, and at the gardens of the Horticultural Society, in November last, show plainly that it requires to be kept in a somewhat confined house, and either planted out in a bed or placed in a very large pot or tub. The former appears the preferable plan, and for its beauty, the fragrance of its blossoms, and the season at which they are developed, it should be cultivated in every conservatory throughout the kingdom.

MAXILLA'RIA MACROPHY'LLA. As its title indicates, this species is peculiar for the dimensions, and, more particularly, for the breadth of its foliage. Its nearest affinity is with *M. Deppei,* from which it is removed by the largeness of its pseudo-bulbs, leaves, and flowers. The last have greenish sepals and petals, spotted and stained with brown, and recurved at the extremities;

while the lip is whitish, mottled below with pink and yellow. It has blossomed for many months at Messrs. Loddiges', and flowers still continue to be produced.

Maxillaˋria Skinneˋri. A plant is at present flowering at Messrs. Henderson's, Pine-apple Place, which was received from the Horticultural Society with the above name. It is, however, the same as was bloomed by Mr. Knight of Chelsea last year, and is either a larger and exceedingly rich-coloured variety of *M. aromatica,* with which it has several features in common, or it is a new and unnamed species. The true *M. Skinneri* has, we learn, flowered with J. Clowes, Esq., of Broughton Hall, near Manchester, and has whitish or blush-coloured blossoms, eight or nine inches in diameter, with a pink lip. The same species, in the collection of Messrs. Loddiges, has pseudo-bulbs not very different from those of *M. Deppei,* but more compressed at the sides, and not so plump-looking.

Mormoˋdes atropurpuˋrea. A curious plant, with a pseudo bulb like the old species of *Myanthus,* and from the side of which the flower-stem proceeds, bearing, apparently, from eight to twelve blossoms. A specimen is thus blooming with Messrs. Loddiges, and the flowers are of one uniform deep purple tint, and have a slightly-polished surface.

Onci′dium —— ? In the orchidaceous house of Messrs. Loddiges, there is now a novel species of Oncidium in blossom, which, in the disposition of its flowers, their figure and colour, approximates to *O. Baueri*, or *altissimum.* The pseudo-bulbs are, however, smaller and more depressed ; there is not that profusion of exposed roots so common in those species, and the leaves are peculiarly long, narrow, and flexible. In the latter feature, indeed, it is more like a very strong-growing species of grass.

Phaˋius grandifoˋlius ; *var.* Messrs. Rollisson, of Tooting, flowered a superior variety of this admirable old plant in the spring of last year ; and Messrs. Loddiges, who obtained it from the former gentlemen, have a magnificent plant of it now displaying its inflorescence. The main difference between it and the species resides in the hues of the flowers ; *P. grandifolius* having dull, wine-coloured sepals and petals, and a purplish lip, and this variety having its sepals and petals of a yellowish-green ground, prettily mottled all over with bright brown, the lip being of an intense brownish purple. It is extremely handsome.

Pri′mula sine′nsis ; *var.* Most persons are aware that the Chinese primrose sports into many varieties, some of which are greatly preferable to others. Messrs. Henderson, of Pine-apple Place, have now a race which is remarkably dwarf, and of a singularly healthy aspect. The leaf-stalks are not more than two inches in length ; the flower-stem from half an inch to an inch high, and sometimes imperceptible ; and the pedicels which support the individual flowers are about an inch or an inch and a half long. The blossoms are particularly large, of various hues, and finely fimbriated round the margin. Were they a trifle more elevated,—which could readily be effected by placing them in a somewhat warmer house,—they would be a very desirable variation.

OPERATIONS FOR FEBRUARY.

In no pursuit is procrastination more hurtful, or productive of more annoying consequences, than in gardening. The effect of deferring necessary operations, whether from carelessness or for convenience, is in all cases alike vexatious and irretrievable. In some instances, Nature will not wait for the assistance of man, when her great processes are to be effected, and such things as pruning may thus be left unperformed till it is really better to dispense with them altogether. In others, she will not be hurried beyond her capacity, and dissappointment may be occasioned when flowers are expected at a given period, by their not being propagated at a proper time.

We therefore begin a new volume by pressing the cultivator to be always beforehand a few weeks or a month in thought of what he has to provide for ; and then, by making slight memoranda, he will be able to proceed happily and prosperously.

Tender plants under protection now demand all the watchfulness which can be bestowed on them. Days or weeks of continuous covering, with, perhaps, the addition of artificial heat, or, in frames, the accumulation of more moisture than can be appropriated, will have caused them to make unhealthy attempts at growth, or have so filled them with fluids that they are in danger of perishing from mouldiness. To such, air must be freely given whenever it is warm and dry enough to be admitted ; and all sickly elongations of the shoots should be stopped. It is of particular importance, too, that the decaying parts of every exotic be taken away as soon as they manifest themselves ; and if the specimen be a succulent, or the decomposition occur in the stem or branches, a little slacked lime should be applied to the wound, and the plant be kept as dry as possible.

While frosts last, or may be apprehended, it will be injudicious to uncover, finally, the specimens that have been sheltered in the open ground. But the opportunity of a fine or mild day should be always seized for exposing them to light and air. Superfluous attention is, to all plants, as bad as neglect, and in no respect is this more clear than with reference to covered out-of-door shrubs. Close and constant protection, by opaque substances, does more harm to such species as are not positively tender, than leaving them wholly unassisted. Hence the necessity for frequently examining them, to see that, by having their branches crowded, or by being too long in darkness, they are not blanched ; and hence, too, the value of frequent judicious exposure.

At this period, soil and all other requisites ought to be got in readiness for potting plants in the ensuing month, or as they may require it. No earth should be used while it is new, or just as it is taken from the spot whence it is procured, but placed for at least a year in the compost-yard, and there turned repeatedly, beneath the influence of the atmosphere. It is a mistake to keep soils dry and in sheds ; for rain rather enriches them than abstracts their virtues.

Now, moreover, or towards the close of the month, the culturist should commence propagating and preparing plants to fill the flower-borders in summer. Where a stock of half-hardy perennials is not already provided, it is better to begin thus early to obtain it. A small hotbed frame will suffice to increase an immense quantity of plants ; and as the heat need not be great at the first, so it may usually be permitted to fall away gradually, without any renewal by external additions to its resources. Such a frame will serve to propagate Verbenas and other plants of that class, Chinese and similar kinds of Roses ; and when nearly exhausted, it will be useful for raising tender annuals, or for the multiplication of all sorts of greenhouse shrubs.

Orchidaceæ, that are developing their flower-buds, ought not to be too much encouraged ; since, when they flower late, their blossoms are usually finer, and of a richer colour. Many species, especially those which bloom so soon in the spring, do not grow and flower at the same time ; and it is while growing, not during the flowering period, that they need extra heat and moisture. In fact, coolness throughout the season at which their inflorescence is opened, retains them in bloom much longer.

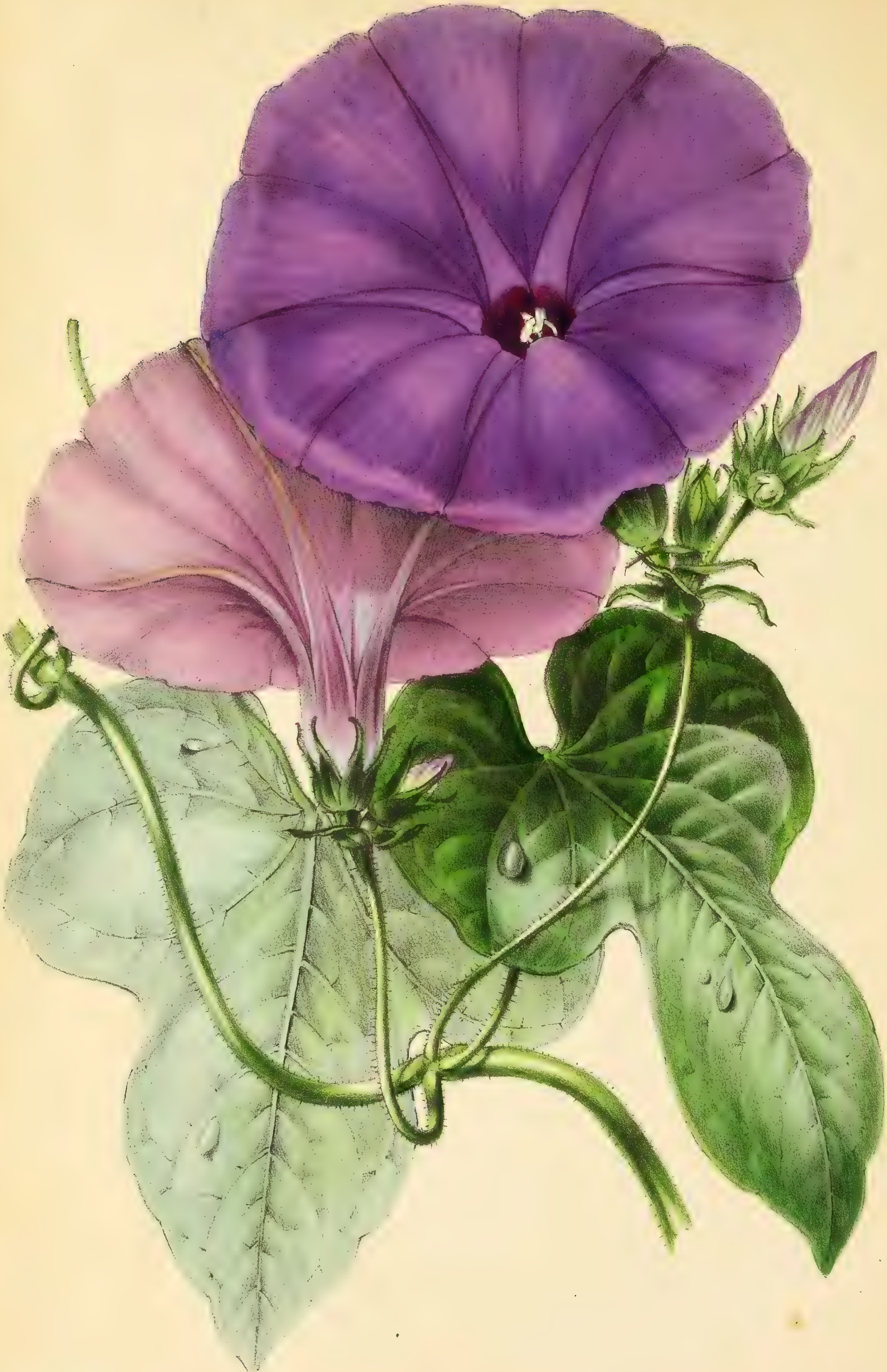
Gesneras and their allies, having rested through the winter, must be repotted forthwith, into a rich compost. Let their tubers be just buried in the soil, and, where practicable, give them a little bottom-heat by plunging their pots into a bed of bark or leaves. Increase their supply of water as they advance.

Succulents can hardly be kept too dry at this time. Water them only when the soil is becoming dusty, and even then be very sparing in the application. It is astonishing how small a quantity of water they require in winter ; and those who retain them in a state of the greatest dryness (so long as they are not shrivelled materially), both as regards the soil and atmosphere, grow them to the highest perfection. *Epiphyllum truncatum* and its varieties, with others that are commonly more or less forced, are the sole exceptions to the rule.

In the forcing-house, insects must be duly exterminated; and with some of the specimens, both the flowers and shoots will need thinning, to render those which are left more perfect. One essential point is to support, timely, all flower-stems that are inclined to be weakly. Forced plants that have ceased flowering should not be placed in the open air, without they are to be destroyed. A spare pit or frame should be devoted to their reception, that they may properly mature their shoots.

Careful watering is indispensable to Camellias that are now about to bloom. Either too much or too little fluid, or great vicissitudes of temperature, occasions them to shed their flower-buds before expansion.

Tender annuals can be sown in pots for the greenhouse ; and those of a hardier description may likewise be sown in pots, in a cold frame, for subsequent planting in the flower-borders. By the ordinary practice, there is a great display of annuals in the middle of the summer, but at no other period. Sowings made now and in May would ensure a more permanent effect.



S. Holden, delt. & Lith

Ipomœa ficifolia.

IPOMŒA FICIFOLIA.

(Fig-leaved Ipomœa.)

Class.
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
CONVOLVULACEÆ.

Generic Character.—*Calyx* of five petals. *Corolla* campanulate. *Stamens* inclosed. *Style* one; stigma two-lobed; lobes capitate. *Ovary* two-celled. *Capsule* two-celled; cells two-seeded. *Don's Gard. and Botany.*

Specific Character.—*Plant* a twining shrub, evergreen, furnished with rough hairs. *Leaves* three-lobed; lateral lobes roundish, middle one narrower, and more acute. *Peduncles* mostly three-flowered. *Calyx* with acute sepals, covered with blackish hairs. *Tube of corolla* shorter than the limb.

To the very handsome genus *Ipomœa*, and the several other genera into which that old group has latterly been divided, it seems almost impossible to procure accessions which shall surpass in either beauty or value those heretofore cultivated. The freeness and elegance of their habits, the richness and prodigality of their blossoms, and the general facility with which they may be managed, give them a decided eminence over many other tribes.

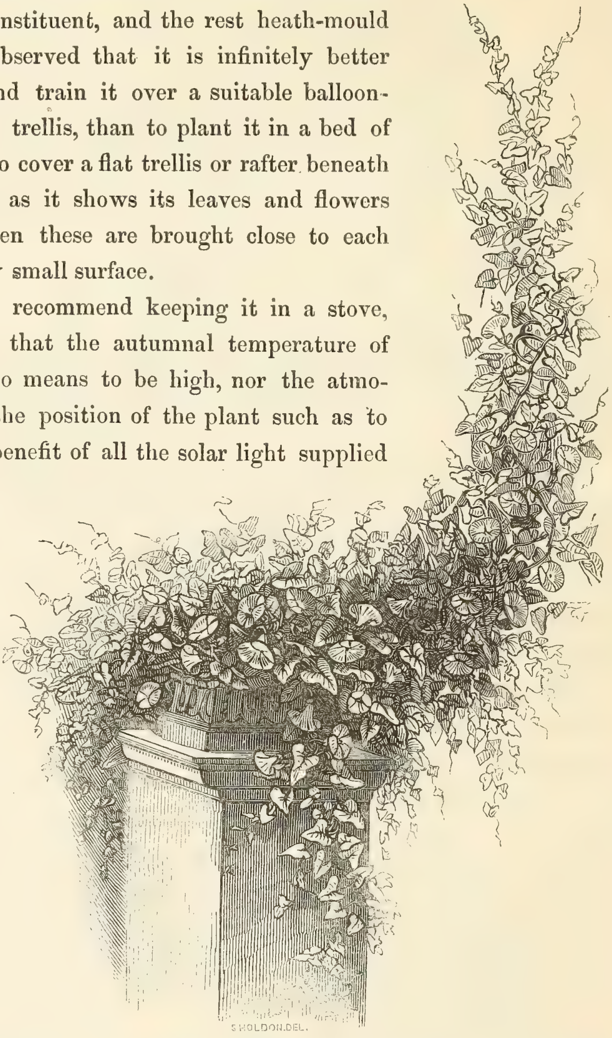
Nevertheless, there are two circumstances connected with the character of the present new species which stamp it as a more desirable plant for ornamental purposes than some of its allies which are at least equally showy. Most Ipomœas of the same class bear flowers which can only be seen in perfection before the sun has reached its meridian; after which their colour changes, and they exhibit a flagged faded appearance. *I. ficifolia*, on the contrary, retains its blooms unaltered throughout the whole day, and shows no signs of withering till it perishes entirely. Its other merit is the development of flowers during the late months of autumn, when it enlivens the stove in a most agreeable manner.

Messrs. Salter and Wheeler, Victoria Nursery, Weston Road, Bath, have the credit of introducing this fine species, which they obtained two or three years back without any knowledge of its native country. Last autumn, it flowered vigorously in many of the London nurseries, and we had our drawing made from Messrs. Henderson's, Pine-apple Place.

From the slight opportunities with which we have been favoured for determining its character, we can safely say that it is a plant whose aspect is greatly affected by cultivation; the size of the flowers varying, according to circumstances, from that correctly represented in our plate, to little more than an inch in diameter. Facts assure us that it can be best grown in a moderate stove heat, and kept in a tolerably large pot, filled with a soil of which nutritive loam is the principal constituent, and the rest heath-mould and sand. We have observed that it is infinitely better to retain it in a pot and train it over a suitable balloon-shaped or globular wire trellis, than to plant it in a bed of earth, and encourage it to cover a flat trellis or rafter beneath the roof of the house; as it shows its leaves and flowers far more favourably when these are brought close to each other on a comparatively small surface.

While, however, we recommend keeping it in a stove, we must distinctly state that the autumnal temperature of such a house ought by no means to be high, nor the atmosphere very moist, nor the position of the plant such as to seclude it from the full benefit of all the solar light supplied at that period. Inattention to these conditions will materially shorten its blooming season, and bring it into a sickly and dangerous state. Cuttings root easily at almost any time.

The generic name is taken from *ips*, *ipos*, bind-weed; and *omoios*, similar, in reference to the striking resemblance of the species to the Convolvulus or Bind-weed. The specific term, *ficifolia*, alludes to the shape of the leaves, which is justly considered to be like that of the foliage on the common Fig.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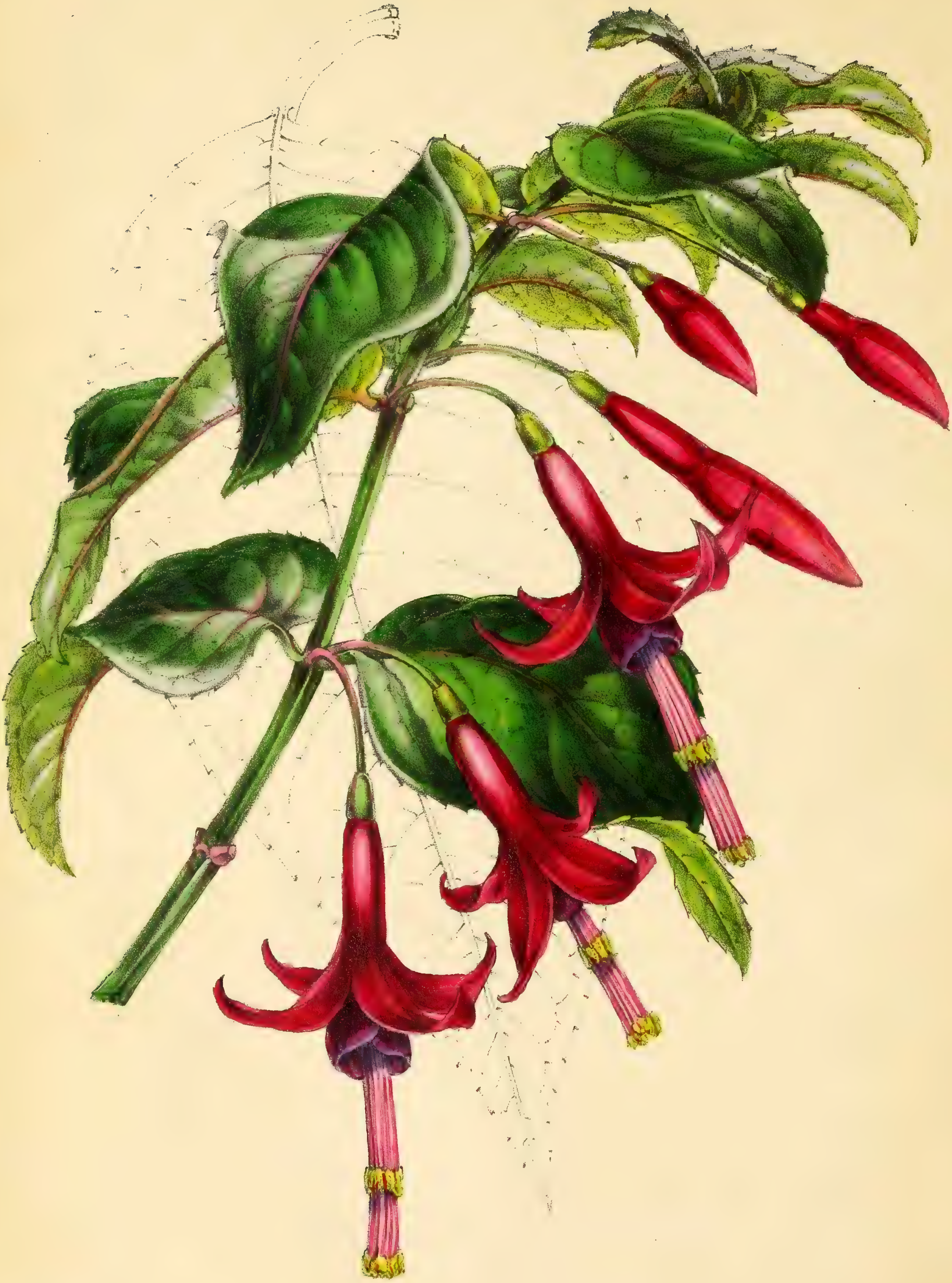


S. Holden del & lith.

Fuchsia radicans.

FÙCHSIA RÁDICANS.

(Stem-rooting Fuchsia.)

Class.
OCTANDRIA.

Order.
MONOGYNIA.

Natural Order.
ONAGRÀCEÆ.

Generic Character.—*Tube of calyx* adhering to the ovary at the base, and drawn out at the apex into a cylindrical four-cleft tube, whose lobes soon fall off. *Petals* four, alternating with the lobes of the calyx, and inserted in the upper part of the tube, very rarely wanting. *Stamens* eight. *Ovary* crowned by an urceolate gland. *Style* filiform, crowned by a capitate stigma. *Berry* oblong, or ovate-globose, four-valved, four-celled, many-seeded.—*Don's Gard. and Botany.*

Specific Character. — *Plant* an evergreen shrub. *Leaves* usually opposite, oval, roundish at the base, acuminate, glabrous, slightly toothed. *Flowers* pendulous, on slender red peduncles. *Calyx* deep crimson, segments much expanded, lanceolate, acute. *Petals* convolutely embracing the stamens, wedge-shaped, purple. *Stamens* long, filiform, red. *Style* filiform, longer than the stamens. *Stigma* red, club-shaped, with a four-lobed apex. *Berry* ovate, deep reddish-purple.

Of the numberless beautiful species or hybrid varieties of *Fuchsia* which now adorn our gardens, there are none whose habit at all approaches that of the species here figured ; and since it unites a high degree of elegance with its peculiarities of growth, it is, what the majority of novelties have little pretensions to be, a valuable addition to British collections.

Plants of it have been in this country for the last two years or more, and it bloomed last autumn in several places, among which we must notice the nursery of Messrs. Young, of Epsom, because it is there alone that we have seen its flowers expanded, and from thence we were permitted to take our drawing.

We are told in the Botanical Register that it was found by Mr. Miers, in the Organ Mountains of Brazil, in 1829 ; but it does not appear that it was then brought to England. In its native districts, it is a long trailing shrub, with stems which branch greatly, and often attain the length of twenty feet, with a diameter of half an inch. As it clings to trees for support, it generally, after the second year, throws out a number of stoloniferous shoots from the axils of the branches, and those shoots produce an abundance of roots, by which they attach themselves to the trees, as in the case of our ivy.

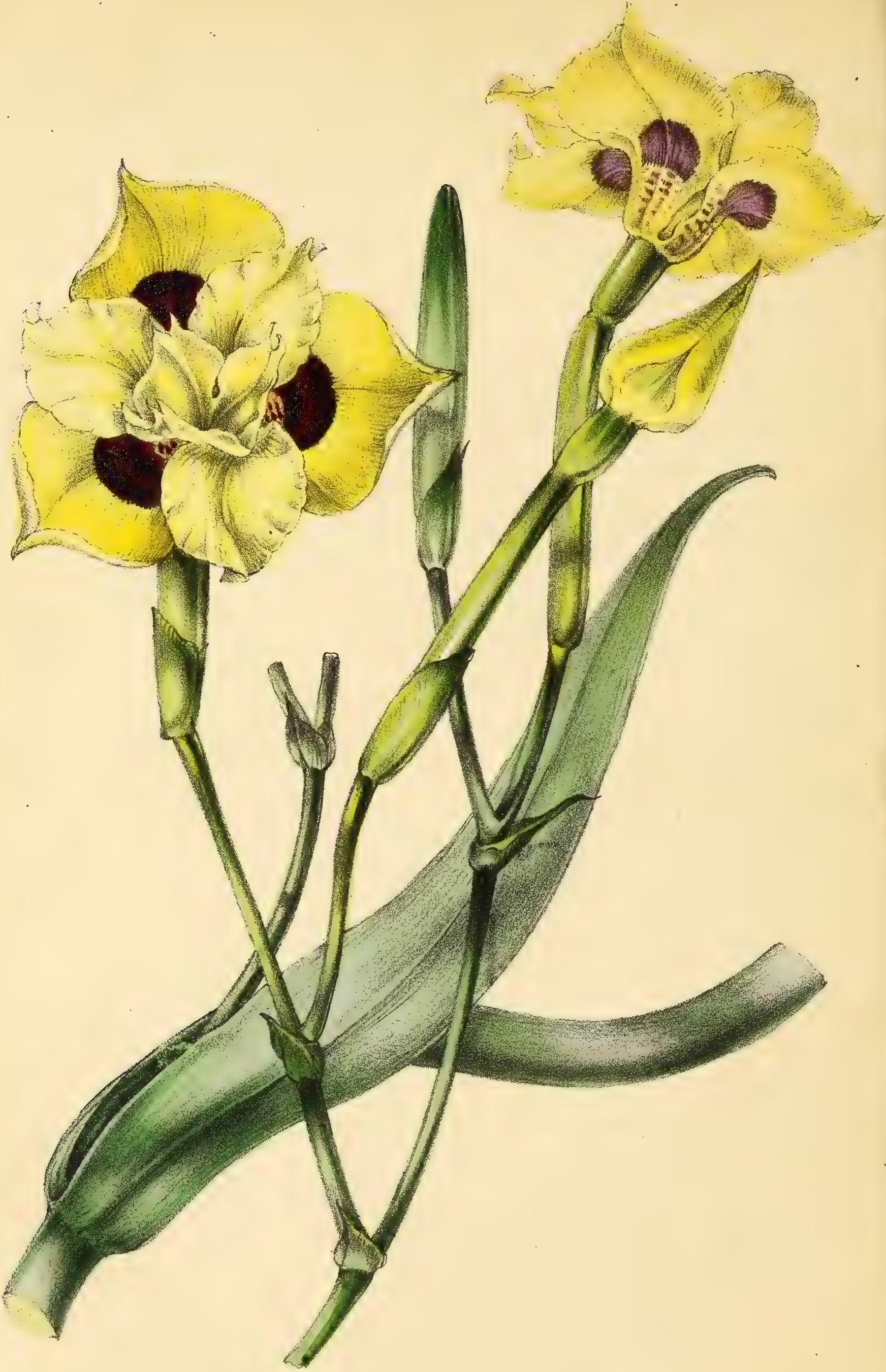
To this very remarkable habitude, it adds a considerable beauty of foliage, the under portion of the leaves being of various shades of deep pink or crimson. The flowers, too, although not far different from those of commoner species, are very richly tinted, have prettily reflexed sepals, and last for a considerable time.

Mr. Miers observes, in a letter to Dr. Lindley, published in the Botanical Register, that "although its native place is just within the tropics, it grows at an elevation of 3000 feet, where it experiences, during the nights of the Brazilian winter in those regions, a temperature as low as thirty-five or forty degrees, Fahrenheit." Hence it would seem to be capable of flourishing in an ordinary greenhouse. It certainly, however, is not injured by being placed in a stove throughout the summer, provided it be not subjected to excessive stimulation.

In garden cultivation, it appears to require more of the treatment of a shrub than a climbing plant. The stems of a large specimen at Messrs. Young's, Epsom, are kept erect, or nearly so, by stakes, and they are now about four or five feet in height. It would be singular, were it not confirmed by yearly experience on other objects, that while the strong plant just referred to has not yet borne a single blossom, young specimens, not more than six inches high, raised from cuttings of the older one, have bloomed profusely. Few gardeners are unacquainted with the advantages of this practice in the instance of newly-introduced plants which will not develop their flowers; but the example here adduced may serve to recal attention to it.

A light loamy soil, and a liberal supply of water in the summer, are the only requisites for the successful culture of this plant. We should prefer having none but small specimens, which have a neater appearance, and occupy less room. It can be multiplied to any extent by cuttings.

Leonard Fuchs, a celebrated German botanist, is commemorated in the name of this genus; and the species derives its title from the tendency of the stems to emit roots at their joints or nodes. In nurseries it is sometimes, but improperly, called *F. affinis.*



S.Holden. del. & lith

Iris bicolor.

ÌRIS BÍCOLOR.

(Two-coloured flowered Iris.)

Class.
TRIANDRIA.

Order.
MONOGYNIA.

Natural Order.
IRIDÀCEÆ.

Generic Character.—*Spathe* common, two-valved, one or many-flowered, conduplicate, or simple and including one flower. *Corolla* tubular, six-parted; lobes equal or very unequal, interior ones often erect, though sometimes reflexed at the extremity, rarely so large as the exterior: outer ones constantly reflexed. *Style* triangular. *Stigma* petal-like, erect, two-lobed. *Stamens* inserted in the base of the exterior lobes of the corolla; anthers upright, linear. *Capsule* coriaceous, oblong or columnar, having three angles, or rarely six, three-celled, many-seeded. *Seeds* horizontal.

Specific Character.—*Plant* perennial, evergreen. *Rhizoma* short, brownish-green, slightly ascending at the end. *Leaves* equitant, linear-ensiform, a little glaucous. *Scape* cylindrical, branching at the top. *Spathe* long, folded, obtuse. *Flowers* showy, yellow. *Sepals* roundish-ovate, with a large blotch at the base. *Petals* oblong, undulated, spreading, of one colour. *Stigma* shorter than the petals. *Anthers* concealed by the stigmas.

By the kindness of Messrs. Rollisson, nurserymen, Tooting, we are enabled to furnish a drawing of this rare and pleasing species of *Iris*, which we have witnessed for two or three years in the collection of these gentlemen, flowering throughout the entire summer, and creating a delightful effect by the fine contrast of colour in its blossoms. These, as will be discerned in the figure, are of a pale and delicate yellow or canary-colour, with blotches of a deep sanguineous hue at the base of each sepal, and beneath them a number of similar spots.

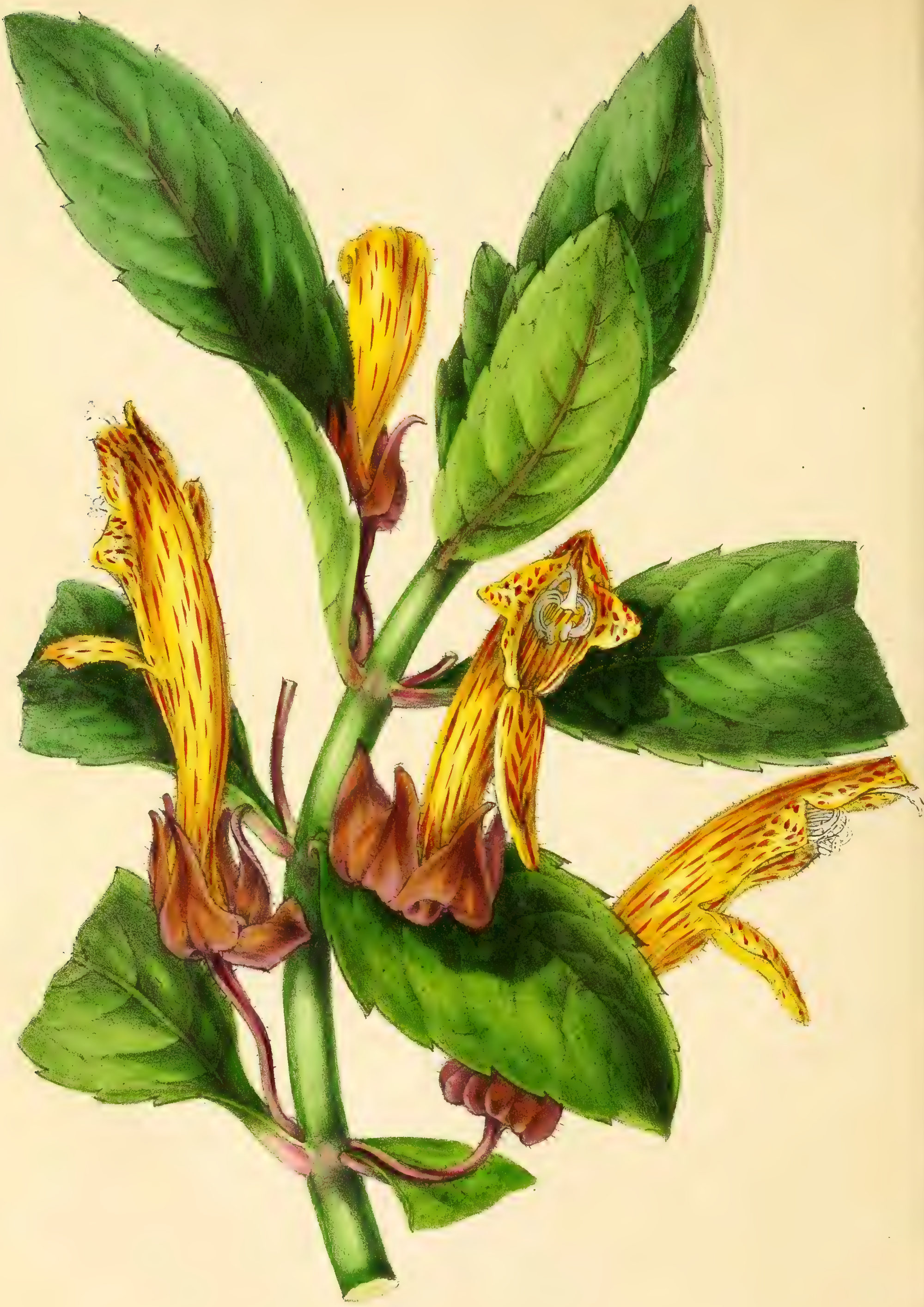
From the Botanical Register we learn that it existed a few years ago in "the garden of the Compto de Vandes, at Bayswater, where the gardener, Mr. Campbell, had cultivated it for many years, but was unacquainted with its origin." Probably it was then confined to choice collections, and has since been diffused very sparingly, for we do not remember to have met with it at any place besides Messrs. Rollissons'.

It is a tender perennial plant, with numerous stiff, erect, sword-shaped leaves, and flower-scapes about two feet in height, from the top of which the charming flowers issue in succession, each lasting only a day. Such, however, is the liberality of their production, that there is scarcely a day in the summer season during which some are not opened.

In appearance as well as in character, the species approximates closely to some kinds of *Anigozanthos*. It seems exceedingly well adapted for growing in a cool pit, or a small greenhouse in which raised beds exist for planting out a few of the rarer dwarf exotics. But it is essential that the aspect of the structure in which it is located (at least for the summer) be such that the stronger rays of the sun may never reach it. Its lovely blossoms will not endure direct sunshine, and if the house in which it is preserved be open to the south, it will require shading in the flowering season.

Further than this, it demands no particular tendance, and might be even placed in the open border during the warmer months, could it be conveniently and partially protected from the violence of the solar rays. It must, however, be housed in winter. A rich loamy soil, with which a little heath-mould can be blended, will form an appropriate compost; and the species is propagated by division at the roots. It should be guarded from too much dampness in winter.

Iris, literally meaning the eye, is used to designate this genus from the variety and clearness of colour in the flowers of the species.



S. Holden, delt. & Lith.

Columnea Scheidiana.

COLÚMNEA SCHIEDIÀNA.

(Mr. Schiede's Columnea.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
GESNERÀCEÆ.

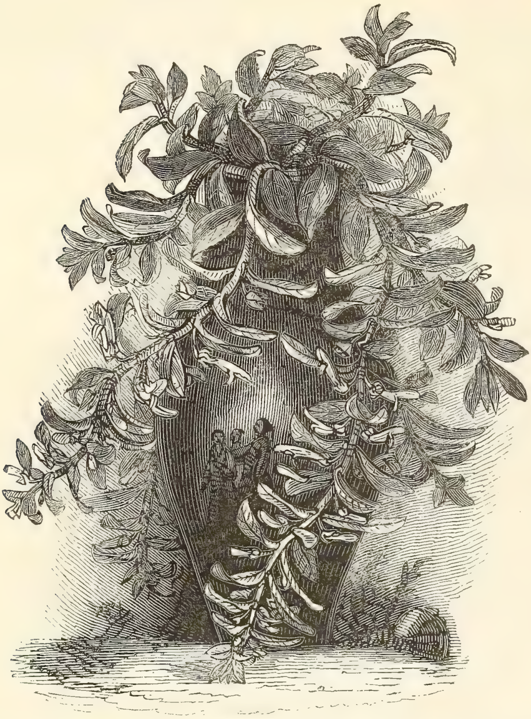
Generic Character. — *Calyx* inferior, five-parted. *Corolla* tubular, straightish, gibbose behind at the base, ringent; upper lip erect, arched; lower one trifid, spreading. *Stamens* four, didynamous; anthers connected with the rudiment of a fifth behind. *Glands* one to five, around the ovary. *Berry* one-celled; placentas two, parietal, two-lobed. *Seeds* oblong.—*Don's Gard. and Botany.*

Specific Character. — *Plant* an evergreen trailing shrub. *Stems* simple. *Leaves* oblong-lanceolate, entire, downy. *Flowers* solitary, axillary, on long peduncles. *Calyx* with five expansive, ovate-lanceolate, acute, spotted segments. *Corolla* large, covered with glandular hairs, and variegated with dingy yellow, or cream-colour, and brown. *Berry* globose, white. *Seeds* oblong.

The plant here depicted, which is not more curious than beautiful, was imported from Mexico in 1840, by J. Rogers, Esq., of Sevenoaks, Kent; and having been presented by that gentleman to Messrs. Rollisson, of Tooting, flowered last year in their nursery, when we were allowed to have it figured. It first bloomed, however, in Mr. Rogers's own collection, and has subsequently flowered in the gardens of the Horticultural Society, and other establishments.

It assimilates slightly, in the form and nature of its stems, leaves, and flowers, to the remaining species of the genus. Still it possesses features by which it may at once be distinguished, and which, indeed, render it very conspicuous. In its natural habitat, it is said to grow on old trees, thus assuming much of an epiphytal character. The stems are, moreover, pendent or trailing, unusually stout and succulent, with indented rings or annular contractions at the joints, and the leaves are of a peculiar colour. The blossoms stand out from the stems on long, half-drooping peduncles, and are singularly large; both these and the segments of the calyx being prettily mottled and streaked with brown on a cream-coloured ground. They are produced in great profusion for a lengthened succession of months, including most of the summer and autumn seasons.

If grown in a pot, with plenty of room for its roots, a moderately nourishing soil, and a barrel-shaped trellis to sustain its branches, it attains to great luxuriance, and the flowers reach a particularly large size. It is thus treated at the Horticultural Society's garden, and apparently kept in a stove of the average temperature.



Messrs. Rollisson do not give their specimens quite so much encouragement, and subject them in winter to the comparatively dry atmosphere of a house with a heat intermediate between that of the greenhouse and stove, in order to throw them into flower during summer and autumn.

But we should advise that this plant be neither cultivated in pots nor in soil, but placed in rustic baskets of wood, filled with sphagnum, decayed wood, the fibrous part of heath soil, and similar vegetable matters, and suspended from the roof of the house, as is done with Orchidaceæ. So treated, the shoots would hang down over the sides of the baskets, and add much to the interest of a collection. Some idea of the effect produced may be gained from the woodcut annexed, which shows the plant depending around a porcelain vase, into which the pot containing it is supposed to have been inserted.

Nothing can increase more readily than this species by cuttings, and we expect shortly to see it in every garden where stove plants are grown.

Plumier applied the generic appellation in honour of Fabius Columna, as he is usually called, or Fabio Colonna, of the noble family of Colonna, in Italy, and the author of some botanical works in the seventeenth century.

GARDENING AS A SCIENCE.

No. II.—VEGETABLE DEVELOPMENTS.

While we profess to look for truth as the foundation of all theory, and repudiate, as inimical to scientific research, that simple credence which takes for granted the mere dicta of authorities, we must not lose sight of system and arrangement. Having investigated the phenomena of germination, our present inquiry will be directed to the order which nature appears to pursue in effecting the development of plants according to the rank which they severally occupy.

It is a position laid down in *Lindley's Theory of Horticulture*, that, germination being established, by means therein described, " all the parts enlarge, and new parts are *created* at the expense of a mucilaginous saccharine secretion, which the germinating seed possesses the power of forming."

" The root being the organ through which food is conveyed from the earth into the plant, is the part which is soonest developed,"—pp. 10, 11.

Of the general truth and accuracy of the order thus assumed, no one will intimate a doubt; but of the *creation* of new parts,—of the expression so employed,—we are jealous. The term *embryo*, however we apply it, expresses a being formed and existing; minute, indeed, as the veriest atom of which the mind can form any conception, but still real. We therefore presume that those electro-chemical disturbances which precede and accompany the development of the radicle do not *create it;* that they, indeed, separate a quantity of carbon from the substances which constituted the dry, unexcited seed, and propel it either in the form of carbonic acid or of some hydro-carbon into that " organism " which we call the root, and " which first begins to move by lengthening all its parts and protruding itself beyond the seed-coats into the earth." But though they thus introduce the matter or substance of woody fibre into the root, they only convey nutriment, which, by assimilation, under the influence of the living principle, causes extension of bulk, but exerts no creative power.

The protrusion of roots is very conveniently observed in a hyacinth grown in a glass. At first, around the basal ring of the bulb a few protuberances are observed: these gradually elongate, become white, and each process, now called a root, is furnished at its point with a spongy substance, that conveys a correct idea of that organic tissue called by botanists a *spongiole*, and which they conceive to be the chief medium of absorption.

During the growth of these roots, and their terminating spongelets, the leaves and flower-stem make little discernible advances. At length, however, they develop, and go through their usual stages of progress. But can any one for a moment believe that creation of parts takes place during the growth and flowering of a hyacinth in a glass of water? In the first place, if we refer to high authority on the structure and offices of bulbs, we find that "bulbs are nothing but leaf-buds, with unusually fleshy scales, and with the power of separating spontaneously from the mother plants; and flower-buds are, theoretically, little more than leaf-buds without the power of lengthening, but with the organs that cover them in a special state." Again, if the bulb of a hyacinth very finely grown to outward appearance, but abortive in the centre, producing neither leaves nor flowers, be carefully inspected, it will be seen to form little embryo bulbs, reposing in channelled grooves, near the basal ring, which gradually enlarge and assume the figure of the parent bulb.

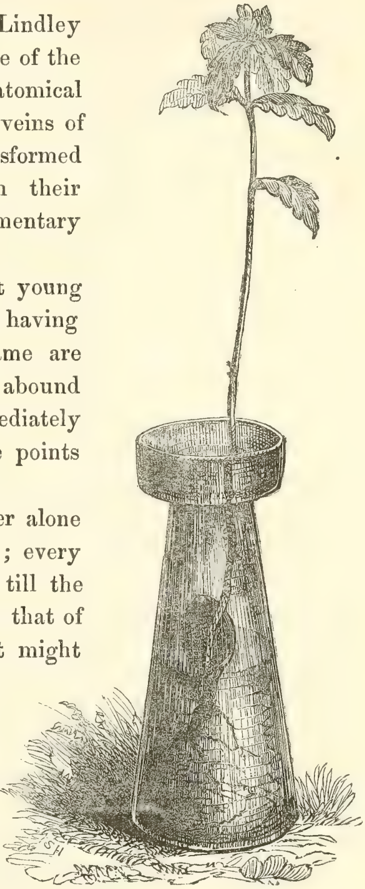
Hyacinths of this season are thus defective, and therefore afford opportunities to the student which ought to be embraced. Now, these infant germs or buds are evidently mere vital points, but furnished from the first with all the organs of the parent; they increase in bulk, lengthen, and assume perfect conformation, but present not one single proof that any part, not pre-existing, has been added to their organization.

Another beautiful example of vegetable development, but from seed, is furnished by an experiment which we must detail at some length; because, from the extreme facility with which it can be conducted, a vast deal of delightful information may be obtained.

Collect in the season some acorns fresh from the oak, for this seed soon loses its vitality by keeping, or by lying exposed on the ground; choose three or four of the largest and most weighty, and suspend them point downwards over water in hyacinth or other suitable glasses, by means of threads—each singly in one glass. The apex ought not to reach the water to within $\frac{1}{8}$th of an inch, and the upper ends of the thread should pass through a cork made to fit the orifice of the glass. Place the vessel on the mantel-shelf of a warm room, and in a few weeks, if the acorn be sound, the shell will crack and permit the radicle to emerge, and pass through the fissure into the water. A perfect root is speedily developed, from which laterals successively protrude: it assumes a curve, winds spirally round the glass, in a direction contrary to that of a hyacinth, and reaches the bottom.

In time, which varies according to the degree of excitement, the plumule expands from the apex also, ascends, and attains the cork, in which a notch must be cut to permit the shoot to pass. A perfect plant is now seen, furnished with large masses of roots, a straight stem, three or four complete leaves: a certain number also of stipulæ in pairs are arranged in a spiral order the entire length of the stem.

Supposing that the acorn produces its shoot in December, we have seen it six inches high early in February; in the course of the first spring it will attain its year's growth of perhaps fourteen inches, and retains its leaves till winter. The water being occasionally renewed, the roots increase, and in some instances produce, or at least are coated with, abundance of whitish granular masses, not unlike small fragments of tapioca: some of these adhere very feebly, and detach themselves from the roots. A second spring exhibits buds, one between each pair of stipules; the wood of the entire stem being perfectly firm, the tint olive green tinged with russet, and with every mark of health; but as yet the experiment has not been carried further.



On the subject of *Stipulæ*, or stipules, Dr. Lindley says they "are attached to each side of the base of the petiole. They have, if leafy, veins, the anatomical structure of which is the same as that of the veins of the leaves." "Stipules are sometimes transformed into leaves; they sometimes have buds in their axils, and may be therefore considered rudimentary leaves."

The annexed drawing will show a perfect young oak at the end of February, 1841, after having passed its first winter. The roots of the same are now (while we write) multiplied sixfold, and abound with glandular matter, from the part immediately below the acorn, and downward; chiefly at the points where the rootlets emerge.

So far we have proof conclusive that water alone has nourished an oak during sixteen months; every leaf was apparently perfect, and not one fell till the last autumn. Now the stem remains firm as that of any oak grown in loam. From the water, it might have absorbed a little carbonate of lime, and a trace of ammonia; but where could it have derived substance—where was the *humus*, the potassa—in fact, the nutrimental substances usually insisted on as indispensable? As to *creation of parts*, the *onus probandi* rests with those who maintain the theory.

IMPORTANCE OF SHORTENING THE SHOOTS OF EXOTIC PLANTS, WHILE IN A GROWING STATE.

Happily for the progress of the human race, the prejudices of what are termed *practical* men are now rapidly yielding before the light of science, and the cultivators of the soil are beginning to be aware that no effect of any kind can be produced with certainty, unless some knowledge be previously obtained of the actual process by which it is brought about.

One good consequence of this feeling is the disposition to investigate for ourselves the means which have been instrumental in promoting improvements, and the positive nature of the systems of procedure which are deemed advancements on former ones. No examination can be more useful than that which induces us to compare the practice of bygone years with that at present in vogue, to sift both of all personal bias, and establish clearly the essential points of difference. We are thus not only led to observe the upward course towards perfection which art is constantly taking, and which must always be gratifying to a reflective mind, but to trace step by step the strides of science, and learn wherein the assumed ameliorations consist, and what are their chief features; thereby acquiring the power of perpetuating them satisfactorily. For it is notorious that the most excellent plans of culture, if confided to the execution of persons ignorant of the principles on which they are founded, and the circumstances which gave them birth, soon degenerate to the very lowest scale from which they had risen.

In the olden times, when the growth of ornamental plants was confined strictly to their preservation, and the word cultivation—or at least the complicated and refined process it has latterly been made to signify—was unknown or little regarded, it was the custom to have plants in houses so arranged as to form, aggregately, a continuous bank or mass, sloping from the back of the house to the front, in which each object assisted in composing the general group, but its individuality was entirely lost. To discover the connexion of its upper branches, with the stem and the pot in which it grew, was often a task of some difficulty, so closely were the specimens packed together. Indeed, it might be said of every plant that it consisted of a long, bare stem or stems, and similarly naked branches, with a few green shoots, leaves, and flowers on their summit.

Nor is this description altogether inapplicable to many of the plant-houses of the present day, where ancient practices are yet adhered to. And we bring it thus prominently before our readers in order to show that it is a relic of a former age, which, when brought to the standards of taste and science, as now fixed, will not abide the test.

The great merit of modern methods of cultivation is that they are based on metaphysical principles. We are aware that this phrase will be objected to, and that gardeners are, for the most part, ignorant of the science to which it refers. But we believe, nevertheless, that the most popular and successful modes of cultivation now adopted have their origin in the known dispositions and character of the human mind. Thus, all have an innate and almost instinctive perception of beauty, and in proportion as cultivators become more familiar with this fact, and with the leading features of the beautiful in art or nature, they adapt their treatment to the production of objects which shall gratify such a taste. And we have no scruple in declaring that the improved plans of managing plants which so markedly characterise the age in which we live are due, in a great measure, to the higher mental culture and refinement—as regards subjects of taste—of the agents engaged in this work.

Perhaps the most striking change which plant-culture has undergone in the last century is in respect to the attention at present bestowed on individual plants. Formerly, as we have said, greenhouse and stove plants were cultivated in masses. All were potted at the same period, all treated alike, or nearly so, as regards soil, water, &c., and if a general surface of foliage, sprinkled here and there with two or three imperfect flowers, was realized, the cultivator's wishes were attained. How unsatisfactory must such a system appear when pictured concurrently with the practice of our more enlightened culturists!

In existing establishments of any note, the object is to obtain specimens; to make each plant beautiful in itself; and to exhibit all its beauties to the best advantage. To effect this, it is treated as an independent object; its actual condition and wants are watched and attended to; it is placed so far from the rest that it can receive the benefit of light and air; and by this means it is rendered so symmetrical that its appearance is rather improved than injured by the isolation.

It was necessary that we should thus enter upon the main distinction between the past and present plans of cultivation, to make the propriety of our subsequent remarks and recommendations apparent. And having explained that handsome specimen plants are now justly preferred to the shapeless and ragged things which are commonly associated in groups, we go on to describe one, and the principal, of the operations necessary to reduce them to that symmetry and perfection of form which shall simultaneously render them most agreeable to be gazed upon at all seasons, and very much increase their fertility.

The problem, then, which we have to solve is, how healthy plants may be retained within prescribed limits, made to assume given figures, to grow in a dense and regular manner, and to produce an infinitely greater abundance of flowers than they are wont to do, provided proper measures are taken for regulating their potting, watering, and all matters connected with the roots. We also propose showing how sickly and weakly specimens, if similarly attended to at the roots, may be speedily renovated, and established in a vigorous and prolific condition. In this effort, we believe we shall embrace the interests of all classes of cultivators, and as the treatment we advocate is divested of all intricacy, and is as easily carried out as it is certain in its application, we cordially hope that it may be received with the credence it deserves, and universally acted upon.

Plants in a state of nature have, it may be observed, an invariable tendency to grow symmetrically, unless when encumbered by other specimens. Beauty of form is therefore imparted by that Power who best knows the predilections of his creatures, and is, in fact, never departed from, naturally, except for some specific purpose, or by the influence of some inimical agent. But in artificial cultivation there are so many circumstances that oppose or subvert this natural disposition, that the aid of man is imperatively called for to assist in eliciting the propensity when dormant, or, more frequently, to check any inclination to shoot beyond it. With the latter we have here to deal.

All exotics, we will assume, are, from some cause or other, which is easily detected in the particular cases, impelled to deviate from their natural symmetry of shape, to acquire an ugly elongation of their stems and shoots, a scantiness of foliage, and, in short, a rambling, straggling character, which renders them unsightly, an encumbrance, and at the same time infertile. Very few real exceptions can, we are sure, be found to this rule; and those are of a description of plants—such as trees which are crammed into large conservatories and stoves—which are really unfit for cultivation. Most herbaceous plants and tropical Endogens,—Palms and Bananas, for example,—may likewise be excepted.

For suffruticose plants, for shrubs of all kinds, whether tall or dwarf, and whether growing in pots or a conservatory border, and for a few herbaceous perennials, biennials, and even annuals, we would urgently advise the removal of the points of either weakly or luxuriant shoots while these are in a growing condition, to render the specimens compact, bushy, and prolific. There are, undoubtedly, some shrubs, among which Rododendrons may be mentioned, which do not require any such aid; but these will be readily discriminated.

Growers of Heaths have long been practical advocates of the plan we now wish to see extended; and its benefits, in their instance, are indisputable. For the last two or three years, however, we have attentively scrutinized the splendid plants brought to the exhibitions of the Horticultural and other societies in the neighbourhood of the metropolis; we have occasionally visited the places in which they were reared, and inspected the collections of men who may properly be designated the best plant-cultivators in the world, and the conclusion we arrive at is that their extraordinary success results, to a large extent, from the practice of stopping the young shoots while growing.

Under this impression, we will briefly advert to the philosophy of the method, the sort of plants in which its good effects have been most palpable to us, and the means of effectuating it, or securing its advantages.

With regard to the first of these heads—the *rationale* of the practice—we do not desire to offer any lengthened observations. It is essential, however, that it be thoroughly comprehended, or the ignorant reception of the opinions of others, which we have so much deprecated and condemned, will only be perpetuated. Stopping the shoots of plants, then, while they are young and tender, is somewhat analogous to shortening the branches of Vines in the summer, though the two operations are intended to answer a rather dissimilar end, and are performed at different periods. The Vine shoot is not shortened till the young fruit is formed upon it, and then it is done to throw additional nourishment into the swelling grapes. Flowering exotics have their shoots reduced, on the contrary, to strengthen them, to prevent them from extending too far, and becoming too weak, and to stimulate them to the production of a much greater number of lateral branches, and a consequently augmented display of flowers. By doing this when those shoots are being developed, the plant is spared the exhaustion which would result from a superfluous expenditure of its strength; the effect of additional vigour in the branch stopped is produced immediately; the lateral shoots, too, are emitted directly after, and the greater profusion of blossoms is gained in the same year. Pruning in winter would never occasion either these or similar desirable consequences. It will be perceived, therefore, that the beauty of the plant before referred to, as arising from the practice herein touched upon, is by no means the only, or even the greatest, of the advantages which the system entails. Superior energy and productiveness alike follow in its train.

It would far exceed our limits to name half the plants on which we have seen this process beneficially employed. Greenhouse and stove dwarf shrubby plants, especially the former, come particularly within its application. The species of *Chorozema*, *Hovea*, *Platylobium*, and *Pimelea*, are good examples. Pelargoniums, Calceolarias, Verbenas, and all suffruticose half-hardy plants, although retarded two or three weeks in their blooming by this plan, have thereby their display greatly heightened and rendered more permanent. Climbing plants, and those trained to low trellises more than others, absolutely need some such check, to induce them to protrude lateral and flowering branches. Many stove exotics, as Ixoras, some species of Euphorbia, Thunbergias, Ipomœas, and similar climbers, are immensely improved by having their shoots stopped when young. And to descend to herbaceous plants and annuals, by removing early the leading shoots of not a few species, their flowers will be much increased both in size and quantity. The instances thus given are merely meant to direct attention to the sort of plants to which such a plan can be applied. They might be extended to include almost the whole of the vegetable kingdom having allied habits.

In adopting, extensively, the system we have propounded, the first requisite is to commence it at an early stage of the plant's existence. Vegetables, like children, may be most easily trained when young, and if then neglected, it is almost equally difficult to reclaim both. As soon as the plants are thoroughly established, and have formed good roots, their shoots should be shortened, that they may branch freely from the very base. Thus made to grow dense at first, they will not afterwards require such close pruning. Repeated reduction of the principal shoots will, however, be necessary in every subsequent year; and it is better to err on the right side, by giving the plant a formal appearance for a year or two, than to allow it to grow too easily at the outset, so as always to retain it in a spreading and straggling state.

Unquestionably the preferable time for effecting this pruning is in the spring months, when the first growth is made. At that season alone, indeed, can the purport of the operation be realised; for it is then that the plants will be able to concentrate their energies on strengthening and solidifying the part of the branch that is left, and on the development of new laterals for flowers. The extent to which each shoot should be reduced must be decided by its comparative thickness. Weakly shoots may be shortened to two inches or less; healthy ones can be retained to the length of three inches; and those which are very luxuriant should graduate between the two. But with plants that are stored in houses, there is ever an inclination, towards autumn, to make a second growth, and it is at that time that the removal of their extra developments becomes of the highest moment. We would take away the whole of these, leaving only about an eighth or a quarter of an inch to avoid the necessity for cutting the old wood. Shoots formed in autumn are never properly matured, and if suffered to remain, soon bring the plant into an unhealthy and unornamental condition.

Some culturists, in abstracting the tender shoots of their exotics, use nothing more than the hand, pinching them off between the nails of the thumb and forefinger. We cannot commend that practice, since it inevitably crushes the shoot, more or less, and must leave it more liable to lose its juices or sap, and in a less likely state to heal rapidly. A sharp knife seems therefore preferable.

The lengthened space we have already devoted to the subject precludes us from saying more than that the plan propounded is as suitable to specimens transplanted into conservatories, as to those cultivated in pots, and really appears calculated, by a judicious employment of it, to create quite a new style of ornamental plants, or, at any rate, to render those exquisite specimens which grace the numerous summer exhibitions more the rule than the exception in gardens of every grade.

TREATMENT OF HYDRANGEA HORTENSIS AS A BORDER FLOWER.

A large and important class of the devotees of floriculture,—and among them, doubtless, are some who honour our pages with a perusal,—are those who do not consider themselves justified in keeping more than one greenhouse, or only a small pleasure and flower garden, and to whom, in consequence, numbers of the finest exotic plants are an unattainable treasure. For the benefit of such, we have always great pleasure in giving publicity to facts which tend to prove that handsome species, which have usually been thought tender, are quite hardy enough to flourish in the open border in many parts of England; particularly as we know that the same facts will be fully as acceptable to the more wealthy cultivator, since all desire to grow them at the least possible expense, and are gratified when they can get them to succeed, unprotected, in our climate.

The *Hydrangea hortensis*, from the showiness and delicate tints of its enormous masses of blossoms, has long been a favourite with all who could afford it a place in a forcing-house in spring, to harden it by degrees, till it perfected its flowers in the greenhouse or the open air. But very few have deemed it adapted for adorning the borders of the pleasure-grounds, and we do not now recollect more than three gardens in which we have ever met with it entirely unsheltered. The extreme beauty, however, of the specimens in these cases, and the inference so naturally arising from them that the species would thrive almost anywhere under the same treatment, induce in us a desire to have its cultivation as a hardy plant generally extended; and with this view we insert the present paper.

When the Hydrangea is to be transplanted into the open border, young specimens should be selected for the purpose, care being taken not to force them prior to their removal from the house. Perhaps the fittest time for planting them out is in spring, just as they are beginning to grow, or towards autumn, when they shed their leaves. At the former period, the shoots which they make during summer are more likely to be thoroughly hardened, while at the latter there will be no danger of the young branches being destroyed by frost. The balance of these circumstances, and the decision founded on it, must be taken by the cultivator.

Before transplanting them, it is indispensable that a proper situation be prepared for them; and when we allege that it should be duly sheltered, we do not mean that this shelter should include shade. The first will be of the greatest service; the last absolutely prejudicial. A warm and not too moist spot, at the bottom of a hill facing any point near the south, or a position enclosed on the bleakest sides by eminences or trees, but not so environed as to shut out the sun's rays, will be in all respects suitable. A very cold locality, or one exposed to severe and cutting winds, will certainly conduce to failure.

But besides the utility of choosing a fit situation, the compost to be employed is of some moment. In pot cultivation, it will be conceded that very much depends on the quality of the soil, and that those splendid clusters of flowers which strike the ordinary beholder with amazement, are not to be obtained without using a greatly enriched earth. To attempt to emulate in size the bunches of bloom produced by plants in pots would be folly, when the specimens are open to all the harmful conditions of our changing climate. Yet, some approximation thereto may really be gained; and to ensure this, attention must be paid to the soil. We have observed plants in shrubberies whose flowers were no larger than those of the most common Viburnums, and of a dull greenish-white hue, which were evidently thus stunted on account of the poverty or inappropriateness of the earth in which they were placed.

The compost we would suggest for out-of-door Hydrangeas is about one-half of fresh and open loam, taken about a year previously from good pasture-land, one-fourth of fibrous heath-soil, and the other fourth well-decayed leaf-mould, or manure. The last-mentioned would serve to enrich the soil, and the heath-mould would assist in checking too great a luxuriance, as well as, most probably, contribute towards giving some of the flowers that bluish tint which is generally sought after and admired.

All we have advanced will, however, be of comparatively little value, unless the culturist attend to pruning and disbudding in the spring, as in the case of potted plants. The Hydrangea is one of those plants which will not thrive well, or develop its flowers finely, if left to itself; and the slight trouble caused by pruning is too insignificant to be noticed. It is known to all who are familiar with the habits of the plant, that the extremities of its shoots are always feeble, imperfectly swollen, and immature; while, when in the open ground, these parts are often damaged by cold. To prune the shoots therefore, down to a point where they are stronger and more robust, is a necessary operation; otherwise, as their points would first expand their buds, and the branches from these would necessarily be sickly, they would likewise draw away the nourishment from the more healthy shoots, and thus the whole would be brought into a state of debility.

Pruning so as to leave about three buds below the point of severance, is the best direction that can be given; though the process of disbudding is frequently necessary afterwards. Each shoot is commonly a flowering one, and unless the stem be very strong, it is injudicious to allow it to produce more than one or two bunches of blossoms. If more are suffered to perfect themselves, it will be at the expense of the size and beauty of all, and of the shoot likewise. This thinning of the buds should be performed as soon as they are fairly opened, when the most promising can be retained, and the remainder rubbed off by the hand.

They who deem the tendance above described superfluous, will do well to experiment on the subject by bestowing it on one or two specimens and neglecting others. We have no fear of the issue. Our aim is to instruct the amateur how to render his plants but a trifling degree inferior to those grown under the most favourable auspices, and we are satisfied that, save in extreme northerly or cold districts, the plan detailed will be found adequate to the attainment of that end. Where the rigour of the locality will not admit of its being effectuated, we would grow the plants in rough wooden boxes, and remove them to a cold frame in winter, plunging them in the flower-borders during summer. Or, by having the boxes slightly ornamental, or employing suitable vases, the specimens can be placed about the pleasure-grounds, in conspicuous places, through the summer, and returned to their winter quarters in autumn. Expedients of this kind are generally resorted to at Chatsworth.

ON EXPOSING GREENHOUSE PLANTS IN SUMMER.

Gardeners, like physicians, are mostly divided in opinion on all subjects connected with the practice of their art; and on no topic have more contrary views been taken and propounded than on the propriety of giving greenhouse plants a month or two of complete exposure some time in the summer. Latterly, indeed, the weightiest arguments have been penned against the practice; and it has been commonly regarded as being justifiable solely on the score of convenience or expediency, and by no means called for by the nature of things, or conducive to the health of the plants so treated. Still there are many who, by their writings, yet inculcate the old notion, and others who, in their practice, acknowledge the influence of that notion. We are bound, too, to affirm that the aspect of plants cultivated by some of the latter class speaks more strongly in favour of the system than all the arguments that have ever been laid before the public.

We propose, on this occasion, to place the matter in what we conceive to be a new light; and while we prove that the objectors to the plan have been generally correct, as far as they have pursued their inquiries, we shall also strive to demonstrate that summer exposure is in itself useful, and therefore proper, if rightly effectuated.

Without canvassing too minutely the reasons assigned by the opponents of this system, it will be desirable just to indicate what are the chief and most potent. First, however, it may be better to state the objects supposed to be promoted by the plan. It is believed, and most justly, that when exotics pass from their dormant state into one of active development, they demand a greater freedom from the contact of their neighbours, and to be kept much further apart from each other. A larger amount of air and light are also requisite, and these can only fill the atmosphere around the plants, so as to act beneficially on their leaves and branches, when they stand at some distance from all other objects. But if the collection be extensive and somewhat crowded through the winter, this important thinning of the specimens can only be made by transferring some of them to the open air.

Again, plants in houses, it is thought, have an invariable tendency to form long and rather weakly shoots, owing to the want of that intensity of solar light which they experience in their native regions; and the absence of that great degree of light is also regarded as a prime cause of their too frequent infertility. The remedy for such defects is naturally enough looked for in the open air, where the largest supply of light which our atmosphere can possibly transmit is, without doubt, obtained.

Further, it is conceived that species which are liable to disease from saturation with water while in the house, become less likely to be subjected to that evil when there is such a constant drain on them as that which exists in the natural atmosphere. Others, which suffer from mildew, are supposed to be preserved from its attacks when taken from the confined air of a house and placed in a purer medium.

From such, and additional circumstances which are hardly worth enumerating, a necessity has been imagined to exist for placing greenhouse plants in the open air while summer lasts; and the practice, once adopted, has grown into a habit, which, though it were shown to be absurd and injurious, could not easily be eradicated.

To the reasons above given, it might be replied that no person ought to cultivate more plants than his houses are capable of containing, assuming that the specimens were arranged at a stated distance from one another, according to their dimensions.

And we hold this to be a valid proposition, which no argument can overthrow. If, for the sake of protection from the winter's rigour, half-hardy plants are introduced among the more permanent tenants of a greenhouse, it is the former which ought to be withdrawn when the health of the rest demands it. An effort to grow more specimens than there is room for in the houses must infallibly defeat itself, and disappoint the proprietor.

As to the disposition of exotics under glass to contract sickly habits, this cannot be the case to any serious extent if they are near enough to the roof; and those who decry the system of exposure very rationally assert that by transferring specimens from a house to the open air while growing, the check which they sustain, and the direct influence of the sun beneath which they are placed, operate most detrimentally on them, and far more than counteract—nay, absolutely reverse—the good they might receive from the valuable agency of light. Examples will be in the recollection of all in which, by being shifted all at once from a greenhouse to the open air, plants with newly-formed shoots and leaves have been deprived of their foliage and nearly killed.

Although it is admitted, to take another position, that greenhouse species are too commonly allowed to become morbid by saturation with water, many ascribe it to carelessness on the part of the attendant, and aver that those turned out in pots, without being plunged, are incomparably more subject to destruction from drought. When the rays of an almost meridian sun strike immediately and unmitigated on a pot, the roots in which lie very near its exterior, it is a great chance, indeed, if they are kept sufficiently moist to guard them from injury. The reference to mildew will hereafter be met.

Having now glanced at the main arguments for and against the exposure of greenhouse plants in summer, it will be gathered that if any scheme could be devised which would allow them the benefit of increased light to ripen, and harden, and give fertility to their yearly developments, and simultaneously relieve them from the danger which results from sudden changes while their tissue is tender, and also from the too violent action of the sun on their roots; it would precisely meet the wants of the cultivator, and for ever set all disputes on the question at rest. Such a plan seems involved in the following proposal.

We would retain the plants in the house till they have perfected their growth, and produced the principal part of their bloom; till their tissue had become considerably indurated, their susceptibility of injury abated, and the extreme heat of the summer had passed; and then, about the end of August or the beginning of September, we would turn them out of the houses, and leave them exposed for about six weeks. Detriment would then be avoided, and a positive benefit ensured. Mildew, which appears chiefly in autumn, would be prevented, the houses would be empty precisely at the time when they are required to be cleaned and painted, and the robustness and proliferousness of the plants would be increased to an amazing extent.

FLORICULTURAL NOTICES.

NEW AND BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR FEBRUARY.

AMARY'LLIS BANKSIA'NA. A beautiful bulbous plant, imported by J. H. Slater, Esq., of Newick Park, near Uckfield, from the Cape of Good Hope. "It is certainly very near the *A. grandiflora* (of which Mr. Herbert considers it a variety), but the shorter peduncles seem to distinguish it satisfactorily, independent of the different colour and expansion of the flowers." It is a greenhouse species, flowering in the autumn, and producing very large clusters of rich crimson blossoms. We are happy to confirm some recent remarks of our own on the necessity for covering bulbs with the soil in which they are grown, by the following citation of Dr. Lindley from Mr. Herbert's work on Amaryllidaceæ. "As they sprout but once a year, nothing can be done to accelerate their growth beyond keeping them in a healthy and vigorous state; for which purpose the bulb must be kept *under ground*, with the neck, perhaps, above ground; but of that I entertain great doubts. If the whole bulb is exposed, it imbibes moisture from the atmosphere in the season of rest, which becomes fatal to it, and I have found the seedlings of which the neck has never been raised above ground in the safest state. A rich light loam and abundance of water in winter, perfect rest and dry heat in summer, are necessary. I lost my bulb of *A. grandiflora* very soon; and I fear all that were imported at the same time have been also lost, in consequence of the dangerous practice of keeping the bulb above ground." We hope these observations, from so eminent a cultivator, will have their due weight. *Bot. Reg.* 11.

ANE'MONE RIVULA'RIS. By no means a handsome species, though hardy, perennial, and somewhat deserving of a place in flower-borders. It is a luxuriant plant, growing about eighteen inches high, and bearing numbers of solitary white flowers, which have a bunch of purplish stamens in the middle, on long, stiff, erect peduncles. "It is easily increased by seeds, or by dividing the old plants; but the seedlings will not blossom before the second season. It flowers freely from June to August. It was first raised from seeds received from Dr. Falconer, of Saharunpur, but it is frequently now to be found in collections of seeds from the North of India." In gardens, it has received the erroneous name of *A. longiscapa*, which is a very different species. Its nearest relation is with *A. pennsylvanica*. *Bot. Reg*, 8.

ARCTOSTA'PHYLOS PU'NGENS. "Seeds of this plant were sent from Mexico, by Mr. Blair, to the Glasgow Botanic Garden, and the plants raised from them produced flowers in February 1841." It is nearly allied to a variety of *A. tomentosa*. "Its chief characteristics are the absence of hairs on the stems and petioles, and the smaller size of the leaves, which are more acute, and more obtuse or cordate at the base. Hitherto it has been treated as a greenhouse plant; but probaby this, as well as the more northern *A. tomentosa*, will be found to bear our winters with impunity in the open air." The leaves are elliptical, and sharp-pointed at the extremity; and the flowers are small, pinkish-white, and in drooping terminal racemes. The plant has at present reached the height of a foot and a half, and is much branched. *Bot. Mag.* 3927.

BABINGTO'NIA CAMPHOROS'MÆ. Formerly called *Bæckia Camphorosmæ*, yet now thought by Dr. Lindley to be a distinct genus, possessing some very curious peculiarities, and named "in compliment to Charles Babington, Esq., F.L.S., of St. John's College, Cambridge, a most zealous and skilful botanist." The chief points which separate this genus from *Bæckia*, are the arrangement of the stamens in threes, opposite the sepals of the calyx, the opening of the anthers by pores at their apex, and the insertion of the latter on the top of the filaments. The species is an exceedingly neat little greenhouse shrub, bearing a profusion of its pretty whitish blossoms at the ends of its curving shoots, throughout the dull autumnal months. "It does not seem to like a loamy soil, but grows well in rich brown peat and leaf-mould." "Mrs. Molloy, a lady to whom we are greatly indebted for seeds from the Vasse River, says that it grows there in swampy land, resembling our *Spiræa hypericoides*, that it grows seven or eight feet high, and in summer forms a delightful shade to the traveller crossing the swamps." *Bot. Reg.* 10.

CE'REUS CÆRULE'SCENS. Easily known by its erect unbranched stems being of a singularly blue or glaucous colour. A specimen in the fine collection at the Royal Botanic Gardens, Kew, about four feet in height, and three inches in the thickest diameter, flowered splendidly in July, 1841. "In point of magnitude and delicacy of structure, the blossoms are equal, and even superior to those of the far-famed *C. grandiflorus.*" They are of a white or whitish-yellow tint, the outer sepals being deeply tinged with a brownish hue. Sir W. J. Hooker observes that the collection at Kew has lately been enriched by a present of that belonging to Mr. Lambert, of Boyton House, Wiltshire. While the late decease of this gentleman will be lamented by all who were favoured with his acquaintance or partook of his liberality, the peaceful close of his long life speaks highly in favour of the botanical pursuits he followed. *Bot. Mag.* 3922.

Cirrhope'talum Medu'sæ. One of the most remarkable of the very extraordinary tribe Orchidaceæ. With small bulbs like a *Bolbophyllum,* it has tall flower-stems, with several sheaths, and on the summit the singular blossoms are densely clustered. The sepals and petals terminate in long, wavy, string-like points, which hang down so as to give the appearance of a head of streaming hair. The interior of the flowers is prettily spotted with pink. The species was obtained by Messrs. Loddiges from Singapore, through Mr. Cuming. *Bot. Reg.* 12.

Clerode'ndron sple'ndens. A beautiful climbing species, introduced to Mr. Knight, of Chelsea, by Mr. Whitfield, from Sierra Leone. It bears large bunches of rich orange or scarlet flowers throughout the autumn and winter. In its native state, Mr. Whitfield says it is found with flowers of "various colours, viz., crimson, brick-dust red, orange, and bicolor (crimson and white)." "I found it growing in what I consider a strong loam, impregnated (from its colour and aptitude to stain linen) with a large portion of carbonate of iron. When the root is shaded from the sun by the underwood, this *C. splendens* attains the height of ten or twelve feet; but if it is exposed to the sun it seldom grows more than three feet." *Bot. Reg.* 7.

Digita'lis lu'tea; *var.* fuca'ta. "The present plant is really a very great ornament to our parterres, reaching a height of four or five feet, and bearing a succession of flowers for many weeks during the summer months." It differs from the species in having its yellowish flowers shaded on the upper part with blush or brownish-purple, while the upper lip or segment of the corolla is notched, not entire. *Bot. Mag.* 3925.

Gode'tia albe'scens. An ornamental annual, a native of America, "having been obtained from the Columbia River for the Horticultural Society, by the late Mr. Moreton Dyer. Its stiff, close mode of growth brings it near *Œnothera densiflora,* from which, however, it is very different in other respects. In cultivation this plant grows a foot and a half high, and requires the same treatment as other hardy annuals. It may be sown in the open border in either autumn or spring, in some place where it is not exposed to the wind; because its roots are scarcely able to keep the heavy stem erect, if the latter is much blown about." The flowers are of a whitish or blush colour, merging into a deep pink towards the margin. *Bot. Reg.* 9.

Mi'mulus ro'seus; *var.* Maclainia'nus. This singularly handsome hybrid was raised by Mr. Maclain, florist, Harold's Cross, near Dublin, between *M. roseus* and some other species; most likely *M. cardinalis.* It has much of the habit of the last-named plant, and the flowers are similarly shaped, but larger, broader, of a rich crimson hue, with a deep blood-coloured centre. Mr. Maclain states, that "this plant succeeds best when grown in rich light compost, a pan of water being placed under the pot, and kept in the bark stove. The flowers do not bear exposure to the sun." *Bot. Mag.* 3924.

Onci'dium pu'bes; *var.* flave'scens. An interesting variety, superior in colour to the original species. The ordinary hue is a dull greenish-yellow ground; but in this instance, it is a bright and lively yellow, with richer brown blotches. "It is a native of Brazil; first detected there by Mr. Douglas, and since found in the Organ Mountains by Mr. Gardner," whose plant flowered in the Glasgow Botanic Garden in October 1839. *Bot. Mag.* 3926.

NEW OR INTERESTING PLANTS NOW IN FLOWER AT THE PRINCIPAL SUBURBAN NURSERIES.

Aca'cia pulche'lla; *var.* hirsu'ta. A pretty variety, raised from Swan River seeds, by Messrs. Henderson, of Pine-apple Place, and at present flowering with these gentlemen. Its stems, branches, and leaves are clothed with short hairs; the foliage is neatly pinnated, and the flowers, which are exceedingly numerous, are of a deep yellow colour, and agreeably fragrant. Like the species, it is valuable as a dwarf evergreen shrub, flowering most liberally in the winter and spring months.

Aspa'sia epidendroi'des. The true *A. epidendroides*, which is often confounded with the other species, has flowered for the last two or three months with Messrs. Loddiges, and seems as if it would continue to bloom for several future months. It has large and strong pseudo-bulbs and foliage, and the blossoms are borne on upright spikes like a *Zygopetalum.* The sepals are of a yellowish ground, mottled with brown, and the petals are of a light purplish tint, merging into greenish towards the outside. The lip is white, passing into purple in the middle, and changing to brownish-yellow after having been expanded for some time. It is rather a handsome species, and is treated like the pseudo-bulbous section of Epidendra.

Bego'nia manica'ta. Named from the singular frill-like rows of spines which surround the leaf at the top of the leaf-stalk. It is an interesting plant, apparently shrubby, at present about nine inches in height, and having large green shining leaves, with irregular clusters of dark brown spines depending from the nerves on the under side. The flowers are produced in loose terminal panicles, and are somewhat small, whitish pink, and numerous. It is blooming finely in a stove at Messrs. Loddiges'.

Epa'cris, *new species.* In the nursery of Messrs. Young, Epsom, there is now blossoming a novel species of *Epacris,* which was obtained from Van Diemen's Land. It is a dwarf and dense-growing plant, with short, stout, and very woody branches, dull green lanceolate leaves, and sessile white flowers, which have a diminutive tube, and a peculiarly expansive and spreading limb. It seems to flower most prodigally, and the blossoms have an odour like those of the Hawthorn. From the other species it is easily distinguished, when out of flower, by its lighter green leaves, which have not the usual polished surface, and by the thickness and stuntedness of its shoots. When grown to a moderate size, it will be a highly ornamental plant. At Messrs. Henderson's, too, there is another new species, which was raised from New Holland seeds several years ago, by the gentleman from whom Messrs. Henderson received it. It has much of the aspect of *E. grandiflora,* but rather more scattered and paler foliage ; and the flowers, which are long, tubular, and pendent, exhibit a beautiful combination of blush and white. It differs materially, however, from a hybrid of this character noticed in our last Number, and is much superior.

OPERATIONS FOR MARCH.

A more than ordinary share of the beauty and interest of flowering plants during the remainder of the season depending on what is now done to prepare them, the gardener ought to be more than usually active this month in order to get everything done at a proper time, and exceedingly careful to have it done in a manner likely to produce the desired effects. By aiming at a very high standard of perfection, it will be rare indeed that his plants will fall below mediocrity, and he may often realise the full extent of his wishes.

House-plants of almost every sort included in the common denominations of greenhouse and stove species will now be pushing forth their buds, and beginning to make their yearly growth. It will be necessary, therefore, to give them a general potting. The nature of this transference must rest, in a great measure, on their individual wants ; but a few regulations may yet be supplied for effecting it under ordinary circumstances.

The vulgar notion of a potting time, or one at which each plant should be shifted into a larger pot whether it be or be not requisite, or, in fact, when a contrary change is sometimes essential, hardly needs combating in this Magazine. One specimen may demand an immediate shift ; it may be better to retain another in its existing condition ; and a third will probably be benefited by being placed in a less pot ; all which can only be decided by the appearance of each.

With those for which a removal to an enlarged medium is decidedly needed, a uniform system of treatment should be adopted. Instead of placing them at once in a pot of the size they will be likely to fill by the time they have completed their summer's growth, all ought to be shifted into pots just one size larger than those they already occupy ; or when the roots are very abundant, and have been too much confined, and it is wished that the specimen should grow luxuriantly, a trifling departure from this practice, by the use of a still larger pot, may be allowed. We insist, however, on the point that great and abrupt changes are prejudicial ; for though frequent and gradual shifting occasions a little more trouble, and may possibly give the plants a partial check at the time of its occurrence, it is admirably calculated for inducing that healthy and constant progress which is a chief desideratum in plant-culture, and affords the manager opportunities of adapting his treatment to the state of the specimens.

There is another class of plants, not belonging to any particular tribe, but composed of specimens of all descriptions, of which we have said that it is best to keep them in the pots in which they are growing. Their condition can only be ascertained by examining the roots ; and to do this, the rim of the pot should be knocked gently on the edge of the potting-bench, keeping the stem of the plant between the fingers, on which last the ball of earth may rest when it glides out of the pot. If the roots have not numerously reached the outside of the ball, and the earth is, notwithstanding, neither hard and dry, nor saturated and sodden, but apparently fresh, open, and capable of admitting the circulation of fluids, or the passage of roots, the whole should be carefully restored to the same pot, and left till there is an absolute necessity for a change.

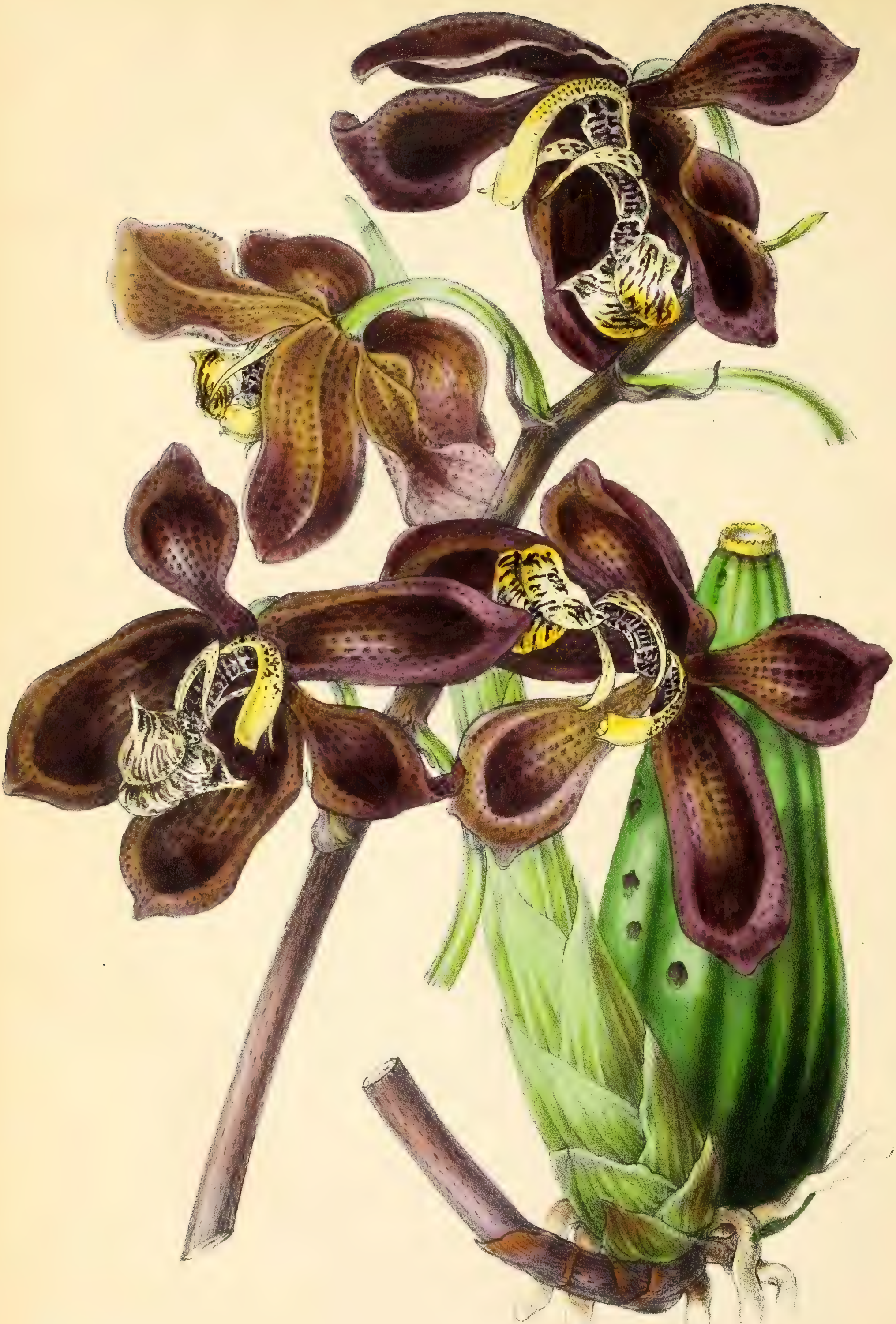
The third group we have indicated, comprises plants which, so far from needing to be placed in larger pots, require nothing so much as shifting into smaller ones. It is granted that the cases of this sort will be few in well-managed collections ; but these few frequently embrace the most valuable species, and the number is much greater in the majority of places. Such plants can be detected by an experienced observer, from the stuntedness and want of vigour in their branches, and the peculiar paucity, yellowness, and sickliness of their leaves. On turning them out of the pot, it will be found that the soil is either soured by being loaded with water, or hardened into a solid mass, and that the roots are scanty, unhealthy, and nearly destitute of fibre. The best remedy, in both instances, is to clear away the old earth by washing ; trim off the diseased points of the roots with a sharp knife ; remove, with the same instrument, the imperfect branches, and put the specimen, with a fresh compost, in a pot just large enough to contain its roots. By watering it cautiously, and placing it in a genial atmosphere, it will then speedily recover.

Orchidaceæ, as we have frequently remarked on previous occasions, may be treated differently from other plants in regard to potting. Instead of shifting them repeatedly throughout the year, they should have only one potting, which can be regulated by their known habits. A more gradual process would seriously injure their roots, and from the porous nature of the materials in which they are grown, there is scarcely any chance of their becoming saturated with water. After potting, the heat of the orchidaceous-house may be increased, and it should be rendered somewhat moister in proportion. Shading can be applied when the sun gets sufficiently powerful to affect the plants materially.

The temperature of the stove may likewise now be elevated a little, and where bottom-heat is employed, the bark or leaves producing it should be stirred or renewed. Pelargoniums, too, will be improved by a temperature slightly above that of the greenhouse ; at least, the atmosphere should be somewhat more confined. And Camellias, after flowering, demand additional heat and moisture. Vicissitudes of temperature, and extreme drought or humidity, should be avoided while the latter plants are producing their blooms, or they will be very likely to shed them prematurely.

In the flower-borders, the division and reduction of herbaceous plants, and the transplantation of perennials and biennials from the reserve garden, should occupy primary attention. If these things be effected in November, or the commencement of winter, the plants are commonly damaged or lifted out of the ground by frost It should be observed, that the younger and outer portion of clumps of herbaceons plants is the most healthy, and should be selected in preference to the centre, which has been more or less exhausted by previous flowering, and by continuance in the same soil.

This is emphatically the seed-sowing month ; since not only annuals, but the seeds of perennial plants, shrubs, and trees, are now to be committed to the earth. As a general rule, they should be covered lightly with a friable soil, and watered sparingly when the weather is dry. Annuals ought by no means to be all sown at once, as is the usual practice, but, commencing directly, sowings should be made every fortnight for three months. The result will be a constant display till the end of autumn, and not a period of extraordinary brilliancy succeeded by one of equal desolation.



S. Holden, del. & Lith.

Houlletia Brocklehurstiana.

HOULLÈTIA BROCKLEHURSTÌANA.

(Mr. Brocklehurst's Houlletia.)

Class.
GYNANDRIA.

Order.
MONANDRIA.

Natural Order.
ORCHIDÀCEÆ.

Generic Character.—*Perianth* spreading; *sepals* partially free; petals a little smaller, unguiculate. *Labellum* continuous with the base of the column, spreading; hypochilium (or lower part) narrow, excavated at the base, and partially two-lipped, its summit prolonged, on both sides, into a lobe, lobes short; metachilium none; epichilium dilated, joined to the hypochilium. *Column* erect, arched, club-shaped, semi-cylindrical, rather shorter than the labellum. *Anthers* two-celled, depressed. *Pollen-masses* two, opening behind; caudicula linear-lanceolate.

Specific Character.—*Plant* epiphytal. *Pseudo-bulbs* conical, furrowed. *Leaves* on long peduncles, broadly-lanceolate. *Racemes* erect, six or seven flowered. *Sepals* oblong, somewhat concave, and, with the petals, rounded at the apex. *Labellum* having the lobes of the hypochilium linear-lanceolate, reflexed; epichilium ovately-triangular, partially hastate, side-lobes acuminate.

For the earliest opportunity of inspecting this remarkable species with which we were favoured, we are obliged to Mr. Knight, of the King's Road, Chelsea; in whose orchidaceous house a fine specimen, from which we were allowed to prepare the accompanying drawing, developed its blossoms last autumn. Since then, it has flowered splendidly at Messrs. Henderson's, Pine-apple Place.

Dr. Lindley, in his admirable Sertum Orchidaceum, states that it "has in many respects the character of *Maxillaria*, and so much resembles *M. Warreana* in habit that I intended to consider it one provisionally, until I could examine with the necessary care the whole of those genera which constitute a division of Vandeæ, to which I propose to assign the name of Maxillaridæ.

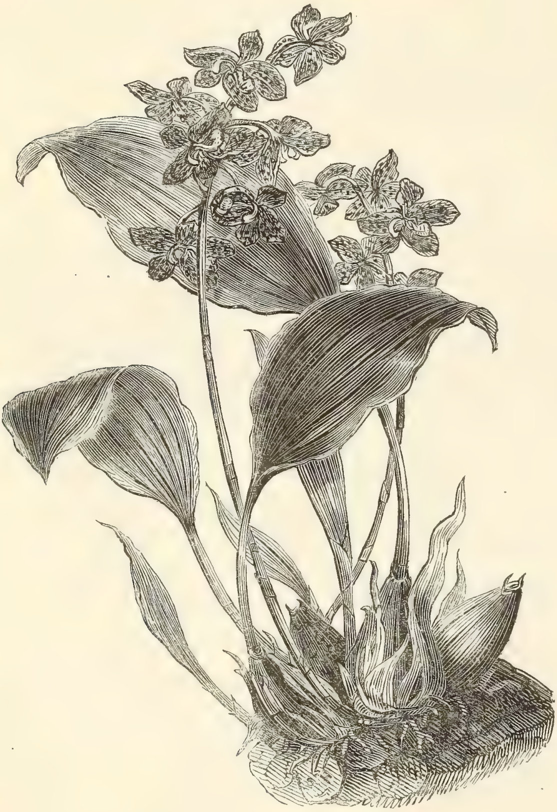
"Recently, however, a plant has flowered in the Garden of Plants at Paris, which, if not the same species as this, must be very near it, and to which M. Adolphe Brongniart has given the name of *Houlletia*, after M. Houllet, a zealous French gardener, who found it on trees in the Corcovado. I therefore at once adopt the genus.

"In some respects, no doubt, it approaches *Stanhopea*, also a Maxillaridous genus; but it has a totally different habit, and the hypochilium (lower half of the lip) is not concave; on the contrary, it is flat, with a funnel-shaped hollow at its base."

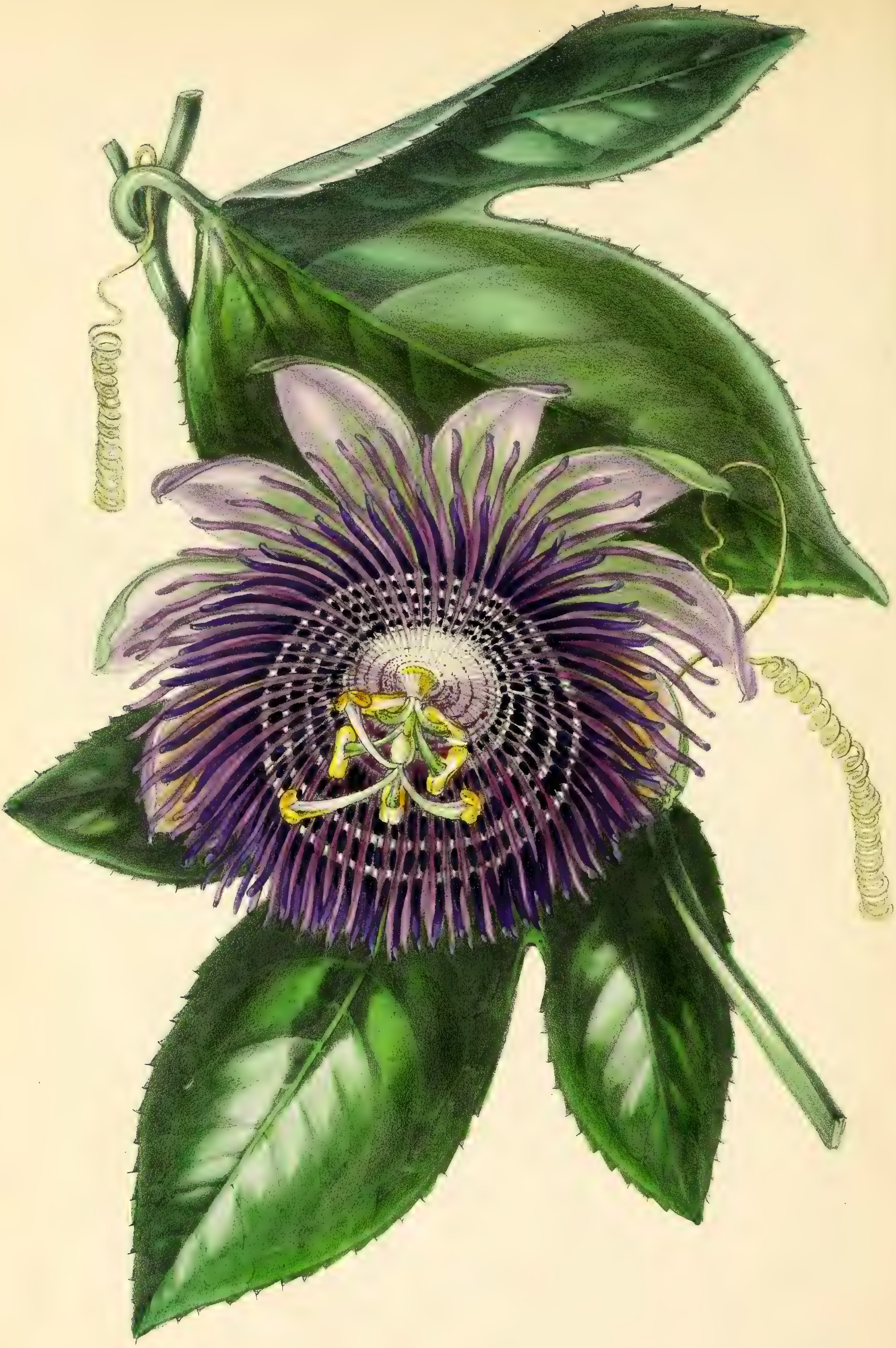
The same authority informs us that "it appears that the credit of first introducing this noble plant from the Brazils is due to J. H. Wanklyn, Esq., of

Crumpsall House, near Manchester. It was first flowered by T. Brocklehurst, Esq., of the Fence, near Macclesfield," and its specific name was applied in honour of that gentleman.

In the pseudo-bulbs and leaves, the plant comes very near to *Maxillaria Warreana.* The former are large, somewhat conical, and strongly furrowed; while the foliage is spreading, with deeply-depressed nerves. The flower-scape being produced at the base of the newly-formed shoots, appears at a time when there is little or no foliage. It is very stout, nearly upright, and bears six or seven handsome blossoms, which are often from three to four inches in diameter. They form a somewhat concave surface, with brownish and richly mottled sepals and petals, and a singularly formed as well as beautifully coloured lip. The latter is well exhibited in our figure, and the whole plant is portrayed in the woodcut.



Although the species will flourish in a suspended basket, it seems to thrive best in a pot, filled with reduced sphagnum, turfy heath-soil, and potsherds. When it begins growing, and while it is in an excitable state, it should be freely watered, on account of its vigorous character; but very little water will be required during its period of torpidity. It is now in most nurseries, and may be propagated by taking off one or more of the pseudo-bulbs.


S.Holden, del. & Lith.

Passiflora Middletoniana.

PASSIFLÒRA MIDDLETONIÀNA.

(Mr. Middleton's Passion-flower.)

Class.
MONADELPHIA.

Order.
PENTANDRIA.

Natural Order.
PASSIFLORÀCEÆ.

Generic Character.—*Calyx* with a five-parted limb; tube short, having the throat ornamented with a filamentous crown. *Petals* five, or wanting. *Stamens* usually five, though rarely with only four. *Ovary* pedicellate. *Berry* commonly pulpy; sometimes slightly membranous.

Specific Character. — *Plant* an evergreen shrub. *Stems* climbing, tendrilled, vigorous, round, smooth. *Leaves* three-lobed; lobes serrated, lateral ones narrowly ovate, acute, middle one broader and longer, also acute; dark shining green above, paler beneath; petioles and minuter veins covered with minute brownish glandular hairs. *Bracts* leaf-like, pale green, broadly-ovate, acute, irregularly cut, and having several large green glands at the margins. *Sepals* long-lanceolate, pale green, profusely spotted with pinkish purple, having a long protuberant horn on the under side near the extremity. *Petals* shorter, narrower, much thinner, pinkish white, and spotted similarly to the sepals. *Segments of the crown* in two equal rows, pale purple, mottled with white. *Filaments* and *styles* spotted with purple.

When this species was first brought beneath our notice, knowing nothing of its history, we had proposed calling it *P. fragrans*, on account of the very agreeable perfume of its flowers. And we perceive that it has been announced under that title by Messrs. Marnock and Manley, nurserymen, of Hackney, who possess part of the original stock.

On being made acquainted, however, with the circumstances connected with its introduction, and requested to name the plant after the gentleman who brought it to this country, we willingly altered our original intention, and have now much pleasure in bestowing the compliment on those to whom it is justly due.

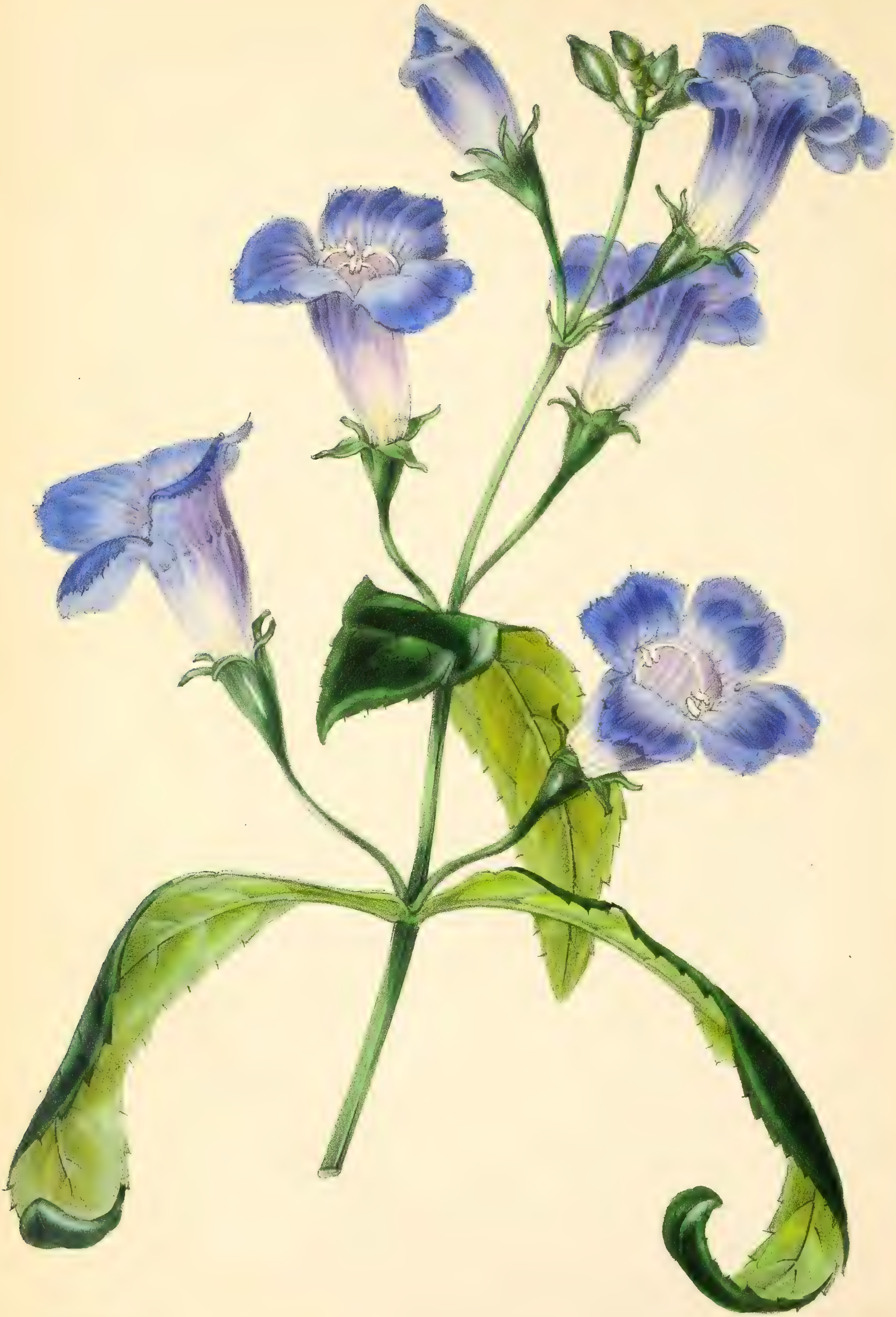
Our figure of this beautiful Passion-flower was obtained from Mr. Upright, gardener to G. S. Ridge, Esq., of Morden, Surrey, in one of whose forcing-houses it blossomed in fine perfection throughout the summer of 1841. It was also exhibited from this place at the rooms of the Horticultural Society in Regent Street.

The merit, however, of introducing the plant is, we find, due to H. Middleton, Esq., who collected seeds of it and many other plants, in South America or the West Indies (it being uncertain from which of these countries the present species was derived), and presented them to his relative, Mrs. Beckford, late of the Firs, Mitcham, Surrey, by whose gardener, Mr. Swabey, they were raised five or six years back, and blossomed about the year 1838. One of the seedling plants was given to Mr. Upright. This appears to be a correct statement of the plant's history; and the specimen which Mr. Upright had so successfully flowered, is now, with the stock procured from it, in the possession of Messrs. Marnock and Manley, while Mrs. Beckford's plants have been transferred to Messrs. Rollisson, of Tooting.

Mr. Swabey informs us that the plant first bloomed in a pot, in the hothouse, and was subsequently planted out in the conservatory, where it did not succeed so well as in the moderate stove heat. A temperature between that of the greenhouse and the stove, with a somewhat close atmosphere, would seem to be the most appropriate; and if kept in a pot, it should be one of large dimensions. Planting it in the border or a prepared bed of a warm conservatory would most likely be preferable; or a similar situation in a cool stove is equally good.

The species is of a luxuriant habitude, with strong stems, handsome dark green shining foliage; and it bears a considerable number of its odorous blossoms. The calyx segments are pale green, with numberless little pinkish dots on the inside. At a short distance the spots are not perceptible, and the surface appears entirely pink. The petals are narrower, with a whitish ground, and similar spottings. The nectary or crown consists of two rows of beautiful purple and white filaments, and is particularly showy.

Altogether, it is a fine addition to the genus, and being easily multiplied by cuttings, it will speedily become common. Young plants can be had at either of the nurseries above specified.



S Holden del. & Lith

Torrenia scabra.

TORENIA SCABRA.

(Rough-leaved Torenia.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
SCROPHULARIACEÆ.

Generic Character.—*Calyx* tubular, plicate, obliquely five-toothed or bilabiate; lips two or three-toothed. *Corolla* ringent; upper lip bifid, lower one trifid: segments almost flat. *Stamens* four, didynamous, the two upper ones short, with entire filaments; the two lower ones inserted at the base of the lower lip, with arched, elongated filaments, which are each furnished with a tooth-formed or filiform appendage at the base: anthers approximating, or adhering by pairs, two-celled; cells diverging or divaricate, confluent at the apex. *Style* simple. *Stigma* flattened. *Capsule* oblong, shorter than the calyx, two-valved; valves entire, with flat margins; dissepiment parallel, placentiferous, at length free.—*Don's Gard. and Botany.*

Specific Character.—*Plant* an annual. *Stem* erect, pubescent at its base, but glabrous above, channelled on two sides. *Leaves* opposite, lanceolate ovate, acutely serrated except at the apex and base, scabrous beneath, but smooth above. *Calyx* five-toothed, smooth, regular, persistent, with acute segments. *Corolla* bright blue, with the segments much jagged.

Of the genus *Torenia*, scarcely anything is known among cultivators, and the present plant seems to have shared, though most undeservedly, the fate of its predecessors, by being cast into utter oblivion; for, until last year, we do not recollect meeting with it in any metropolitan collection. Then, however, we observed it in the greenhouse of Mr. Knight, Chelsea, and being pleased with its appearance, and with the pretty blue colour of its blossoms, we presumed that our readers would not be less gratified with a figure.

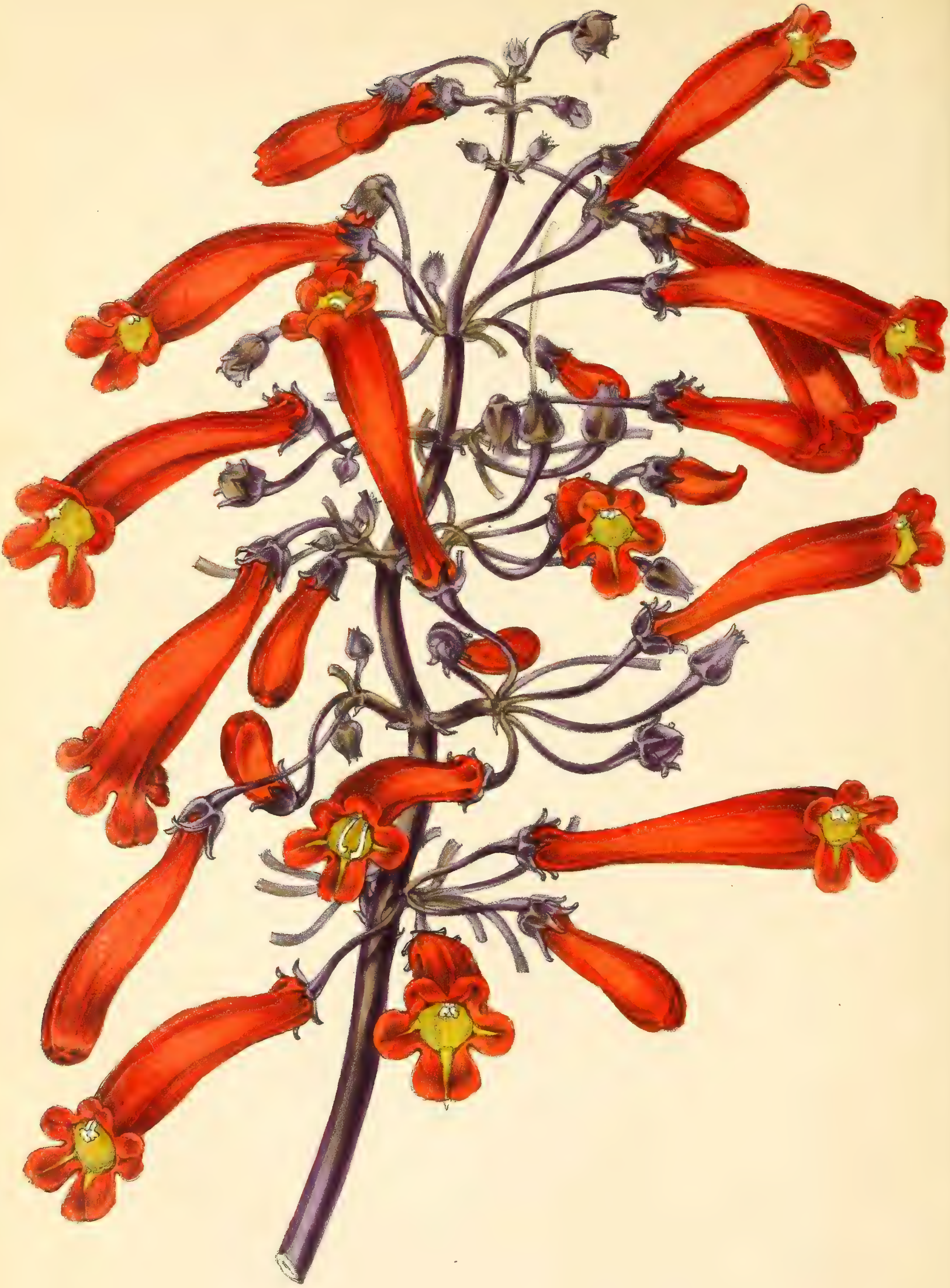
It is an erect-growing, annual plant, usually reaching the height of about eighteen inches, and neither rambling about nor exhibiting too dense an arrangement of its branches. Towards the extremities of the shoots the blossoms begin to unfold themselves, at first issuing from the opposite axils of the leaves, and afterwards forming a kind of loose cyme. As the individual flowers remain open for a considerable period, and those above them continue expanding when the lower ones fade, a display of bloom is kept up till late in the autumn. The blossoms are about an inch long, and of an equal diameter; and the segments being well thrown open, as well as the colour being a most delightful cærulean tint of blue, their effect is very agreeable. Indeed, the species is a desirable ornament to the greenhouse.

According to the Botanical Magazine, seeds were sent from New Holland by Mr. Fraser, in 1830, and communicated to the Botanic Garden at Edinburgh. It has since been found at Moreton Bay, and other warm districts of the same country.

Among the early cultivators, it was considered an annual or biennial plant, and it now appears to be qaite an annual in habit. In its treatment, the common mixture of heath-soil and loam is found a suitable compost, attention being of course paid to drainage.

It can be increased by cuttings, in the usual manner, and likewise, more certainly by seeds, which it will generally ripen, if the upper flowers are abstracted, and only the lowermost ones left to bear seed. Plants which are wished to be ornamental ought not to be suffered to produce seed.

Torenia was named by Linnæus after Olof Toren, a Swedish clergyman, who discovered *F. asiatica*, and other plants, in China. The species, *scabra*, is only scabrous on the under side of its leaves.



S. Holden, del & Lith.

Gesnera discolor.

GESNÈRA DÍSCOLOR.

(Discoloured flowered Gesnera.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
GESNERÀCEÆ.

Generic Character.—*Calyx* adnate to the ovary; limb nearly equally five-lobed, free. *Corolla* half-superior, tubular, with five gibbosities at the base; limb sub-bilabiate: upper lip drawn out, emarginately two-lobed; lower lip three-lobed. *Stamens* didynamous, with the rudiment of a fifth behind; anthers at first cohering into a round head. *Glands* five, or fewer around the ovary. *Capsule* dry in the calyx, one-celled, incompletely two-valved; placentas two, parietal, many-seeded. *Seeds* scrobiform.—*Don's Gard. and Botany.*

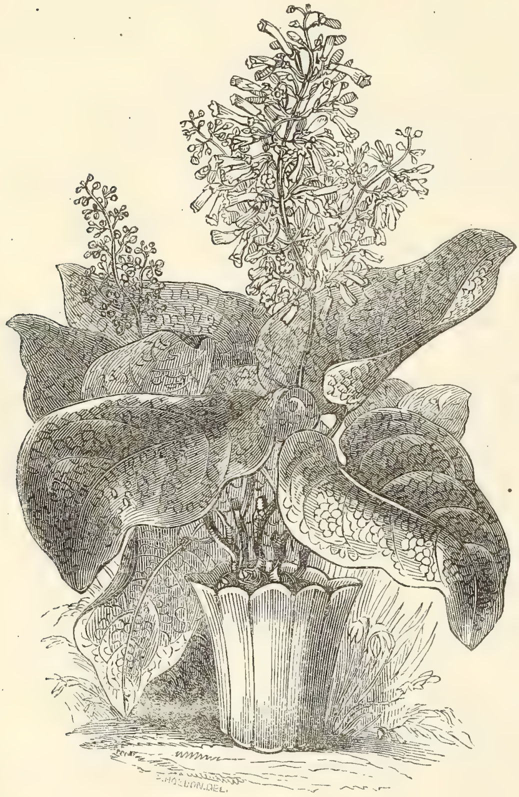
Specific Character.—*Plant* shrubby, apparently deciduous, growing from eighteen inches to two feet in height. *Leaves* opposite, ovately cordate, finely-toothed, rugose, downy, dark green above, pinkish purple beneath, having long petioles. *Panicles of flowers* without leaves, smooth, varnished, and, with the pedicels, deep purple. *Corolla* club-shaped, smooth, nearly twice the length of the pedicels; limb with nearly equal roundish lobes.

From all we can learn regarding the native habitat of this splendid plant, it seems to belong to the province of Rio Janeiro, and to have been obtained from thence about three or four years since, by a friend of Messrs. Young, Epsom, to whose establishment it was added in 1840. During the year 1841 it bloomed almost incessantly, from April to October, in the nursery of these gentlemen, and we were frequently enabled to observe its character.

The whole of our observations go to prove that it is a decided shrub, losing its foliage only for about two months in the winter; and it would perhaps be evergreen were all the conditions of its culture perfectly favourable. From a large tuberous root, the brownish stems arise to the height of about a foot, when they diverge into short downy branches, which are terminated by long and spreading panicles of richly-tinted flowers. One of these panicles is represented in our coloured plate, and as the size of our page would not admit of the leaves being shown, a woodcut of the entire plant is subjoined.

One of the most beautiful features of this species is the outline and colouring of its noble foliage. Each leaf, before it arrives at its full size, (and it is several months in its progress towards this,) is laced or fringed round the margins of its serratures in a most delicate and elegant manner, and its numerous veins are raised considerably on the lower side, as well as of a purplish hue: thus presenting a curious and highly-pleasing appearance.

Possessing such a characteristic from its youngest state till it reaches maturity, and developing it anew and more freely each succeeding year, besides flowering so abundantly and continuously, our plant must be regarded as a very valuable stove shrub. And the large size to which its leaves ultimately attain, surmounted as they are with the graceful and showy inflorescence, render it quite a striking object in a stove throughout the principal part of the season.


F.HOLDON.DEL.

It has been grown hitherto in an enriched loamy soil, to which a little heath-mould is added. In spring, after being repotted, it is plunged in a bed of fermenting bark, or leaves, and kept there till it flowers, or till the months of June and July, when it is taken to a cooler stove, or simply removed from the bark, and placed on a stage. When it has once flowered, it is probably a good plan to shorten the stems a little in winter, by which means they will be urged to form more lateral shoots, and be more likely to flower liberally.

Cuttings or leaves can be taken from it so very sparingly, that only one or two plants have yet been procured from that mode of increase. But, last year, a quantity of seed was ripened, from which Messrs. Young have just raised an excellent stock of the plant, and it may now be generally diffused.

GARDENING AS A SCIENCE.

No. III.

It is not our object to enter minutely into the structure of individual plants; that inquiry belongs to the physiological botanist; and amidst the boundless varieties of the vegetable kingdom it would be impossible to particularize.

The vital principle of plants remains a mystery deep as that which in the animal creation involves the power of volition; but we are not forbidden to investigate effects, and from thence to obtain a glimpse of their immediate causes.

Believing, as we are constrained to do, by analogy of facts, that there is no such thing as a creation of new parts—or in other words, that every increment, either as respects number or enlargement of parts, is simply a development of what had existed from the first germination of a seed, it will be our endeavour to trace in the general structure of a plant, whether it be a tree or shrub, as the most noble,—a perennial, herbaceous,—or annual plant, that runs its simple course,—the one great principle which by infinitely diversified machinery still operates alike in all.

We have already alluded to the processes of germination, and the development of roots, but these are effects and nothing more; the vital principle is the cause of all: thus, to take an example from the highest class of vegetable beings—an exogenous tree—if a cherry be investigated daily, under the microscope, from the time when the fruit enlarges and has thrown off the blossom, a change in the structure of the embryo seed will be perceived day by day—a vital speck, a little atom of transparent fluid, is early discernible, which gradually becomes organized, till at length the fruit ripens, the seed is perfected, and thus prepared to germinate and display the rudiments of a tree.

If there be *creation* in any one of these earliest, and all subsequent developments, though extended perhaps through an indefinite number of years, it can only be referred to the process of impregnation; yet even here we meet with difficulties, for what is, indeed, the *farina* but an organized rudiment, which only requires an appropriate medium to enlarge itself into a perfect fœtus?

We will, however, attempt to draw a distinctive line, and then allude to the vital theory of Mr. James Main, which, though some may deem it fanciful, contains truths and reflections so startling, as to rivet attention and lay claim to the most vigilant and respectful investigation.

A living plant, small or great, even in the condition of a seminal embryo, possesses a vitalized "organism;" all the parts are subject to death and decay, hence the period of their duration is limited; they moreover require nutriment, to provide for their progressive increase. This nutriment, as we have seen, is derived from the earth, or air, and hence consists of elements subject to the laws of chemical action. Under the stimulus of the vital principle, (which, as a second cause, we think is almost proved to be electricity,) the plant, from its infancy, absorbs food, and laborates or digests it in a way conformable to its individual constitution. All the laborating or vitalized parts of the plant are therefore present in and from the earliest rudiments of the seed; all are fed, and in proportion become enlarged, but not one is subsequently created. On the other hand, all the nutrimental substances attracted into the cells, however duly assimilated, never become organs; they are merely matters which supply the wants of the *vegetable*, as bread supplies the demands of the *human* frame. Hence the art of man can only induce stimulus, and must entirely fail to add one individual vitalized atom to the organic structure. Whatever particles, therefore, a plant attracts, may be considered nutrimental; whatever it rejects, whether through the exudatory organs of the root, or by the stomates of the foliage, must be deemed fecal.

The following extracts from Mr. Main's *Illustration of Vegetable Physiology* are extremely apposite, and perhaps incapable of refutation.

"Every developed member of a tree is imbued with the vital principle in its early existence, and retains it while in the act of expansion, but no longer. There are two states or degrees of vegetable life. The first is always present in those members which are capable of amplification, or are in the act of accretion, i. e. expanding from a small to a large volume. The second is that state in which it is only conservative, but without the power of a further growth of the members preserved by it. The first, it is deemed proper to designate by the name of *vital envelope*, whence proceeds every new member of trees, shrubs, and many herbaceous plants."

"This slender body of vitality, or *vital envelope*, is constitutionally compound, not simple, as such a thin tissue may be supposed to be; containing the rudiments of both roots and buds; and, moreover, is the source of all accretion, whether as to magnitude or number of parts produced.

"The foregoing idea of the existence of a distinct vital member, whence all new accretions proceed, is directly opposed to the modern doctrine of the 'organizable property' of the elaborated sap of plants. The idea is founded upon the general law of vegetable nature, for where do we find the most insignificant vegetable body come into existence without having a pre-existing embryo or rudimental atom, whence it derives its essential structure and qualities? There is no such instance in nature. Can the most minute species of *Fungi* spring forth without its propago, or the smallest herb without a seed, or previously existing part of itself? Is the bark or wood self-productive? No; when either is destroyed, it cannot be renewed but by the assistance of the vital member which is the origin of both."

As Mr. Main's theory so far is based upon the development of the new layer of wood and bark which is annually made through the medium of the vital membrane, generally called *Cambium*, he dwells almost exclusively upon those developments. One paragraph in reference to buds must not be overlooked.

"The new *layer of wood* which is added to the old stem or trunk ranges with the first layer of wood on the terminal shoots; on the latter all primary buds, and consequently branches, originate."—"The pith, wood, buds, and bark of every shoot are all simultaneously produced,"—and thus, as he observes, "The majestic oak, or the magnificent Banyan Fig, the latter shading acres of surface, all originate in an atom of a seed."

The idea is sublime, and is in substance the counterpart of that suggested by Dr. Chalmers—for assuredly the microscope is calculated to reveal the wonders of creation more impressively than the telescope—infinite minuteness of parts, yet all perfect, as are the grandest developments of the forest!

While Mr. Main argues for the existence of a vital membrane (*Indusium*) which comprises all the future layers of alburnum and liber in corresponding pairs, and also all the atomic germs of future buds, we must dwell more particularly, now, upon the vital system of a plant as it emerges from the seed, it being our object to pave the way for future observations upon the scientific operations of horticulture.

If it be granted that a seed contains the embryo of a plant, be that plant annual, biennial, perennial, herbaceous, shrub or tree, then we contend that in that seed all the vital organs which are requisite to the plant during the entire course of its existence are present; nothing is or ever can be superadded to the structure, though we admit that every atomic organ requires stimuli and nutriment. In the application of these consists the skill of the gardener, and much insight, study, and observation are required at his hands.

If our physiological view be correct, the seedling contains all the rudimental buds (*preorganized germs* of Du Hamel) of its future processes, and in that case we begin to obtain a clue to the mysteries of those operations which have too long been performed empirically.

One further remark is called for in reference to the wonderful provision of seed-leaves (cotyledons): nature having thus provided a store of nutriment exactly suitable to the necessities of all the organs of vitality which the art of man is not qualified to supply. These seed-leaves, therefore, do not appear to be vital in the higher sense of the term: connected by living tissue with the organs of the plumule and radicle, their substance yields to the attraction which those organs exert; it then becomes dry and effete. If those magazines of nutriment be injured or destroyed, the plant is quickly paralysed in proportion, or perishes; hence great care and circumspection are indicated; and as there are predatory enemies always on the alert, and too minute to be easily detected, we are not to be surprised that an entire promising crop but too frequently perishes by the destruction of the seed-leaves in the course of a few hours.

CONSERVATIVE WALLS.

In addition to the various erections long devoted to the cultivation of flowering exotics, a new one has, within the last few years, been brought into notice, which has obtained the name of a conservative wall. Adopting this as an appropriate appellation, we intend here explaining what are its principal features and uses, and afterwards supplying a design which we think involves a material improvement on former methods of constructing such objects.

Conservative walls are those of an ornamental character, erected in pleasure-grounds, and furnished with flues, or other means of conveying artificial heat to the plants grown on them, as well as facilities for covering the latter externally during cold weather. They may, however, be without any arrangement for receiving fire-heat, and be simply provided with some adequate protection on the outside; but in this case, only half-hardy plants can be cultivated, and not the more tender greenhouse species.

The purport of all such walls is to afford the means of growing those greenhouse plants that can be attached to a flat surface, without the cost of erecting and maintaining a greenhouse, and, at the same time, to add a most delighful feature to a pleasure-garden, and exhibit the gratifying spectacle of delicate exotics flourishing and blooming with more than their usual vigour in the open air throughout the summer.

For the attainment of the ends just specified, several circumstances have to be taken into account. Convenience and propriety suggest that the wall should be as near as possible to the boundary of the pleasure-garden; for if reared near the middle, or at any distance from the outside, it will not only be difficult to convey fuel to it, and to conceal its northern side, but it will appear objectless, and decidedly out of place. A plain wall is nowhere tolerable save when it defines the limits of an estate, or of a particular department. And perhaps the fittest situation for a conservative wall is between the pleasure-grounds and kitchen-garden, or in that part of the former which is contiguous to the offices. In either of these positions, it will form an agreeable line of separation.

But it is of chief importance that the aspect of the wall be attended to, whatever else may be disregarded; and unless the spot between the portions above mentioned offer an exposed front to the south or south-west, some other must be selected. In most villas, or small mansions, a line of wall, architecturally finished, and carried along in direct connexion with the house, before the offices, may be readily obtained, and would be a desirable appendage to a residence, while it served to conceal the meaner parts of the building.

With very few exceptions, wherever conservatory walls exist they have been erected as mere boundary fences, and covered with ornamental plants solely with the view of relieving their nakedness. The consequence has been, that besides being without the means of heating them, they have two prominent defects which we consider very objectionable in an ornamental garden. The first is, that they are destitute of all architectural beauty in themselves, and do not exhibit the plants properly; and the other consists in the absence of trellises for tying the plants to, on which account a slovenly aspect is almost inevitable, for shreds and nails, and the numberless crevices which the latter occasion, are very unsightly on a wall to which flowering climbers are trained.

What seems to us necessary to impart a suitable character to an ornamental wall, is the occurrence of more prominent parts at certain intervals, or the division of the whole into recesses and projections. The latter, by being of limited dimensions, will serve for the display of the more hardy kinds of plants, and also give some degree of shelter to the remaining portions. If, moreover, the whole be surmounted by an appropriate coping, its beauty will be greatly enhanced.

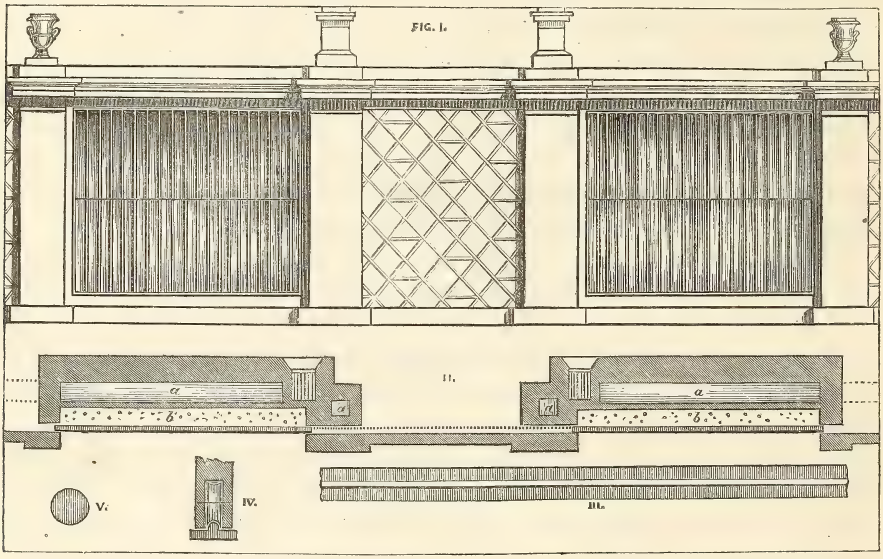
Much has been said of the conservative wall at Chatsworth, the leading characteristics of which are a practical illustration of the opinions now advanced,—large retiring compartments, covered with a neat trellis, and relieved by occasional small stone projections or piers; and as the wall stands on a steep slope, each of the piers is raised considerably higher than the one below it, thus constituting, as it were, a series of very broad ascending steps on the top.

The advantage of having a slight wooden trellis against the wall, instead of fastening the plants to it in the usual way, need scarcely be pointed out. Independently of its superior appearance, which is a point too frequently neglected in such matters, the greater ease with which the branches can be attached to it, and removed or altered at any time, is quite sufficient to give it the preference; while the destruction and defacement of the wall consequent on the use of nails, and the injury they often occasion to the shoots of the plants, give a value to any system by which they can be discarded. The extra expense of the trellis is too trifling to be regarded.

Since the attempt to grow tender exotics against open walls was first made, a fact of considerable moment has been developed relative to their protection. It has been found that whatever tends to preserve the border in which they are planted comparatively dry through the winter months, does more towards sheltering them from the injurious influence of frost than extensive protection of another kind which does not include that provision. This is accordant with the truest philosophical theories, and is capable of application to many instances beyond that immediately in question. It proves that as most of the fluids of plants are imbibed through the roots, and as the heat of vegetable bodies escapes mainly in proportion to the fluids they contain, protection to the medium in which those roots are growing is certainly not less, and possibly even more, needful than to the stems and branches.

In applying such a principle to plants trained to conservative walls, it will readily be seen that some sort of covering is requisite which will embrace at least that portion of the border in which the principal roots lie; and where the canvas, or other protection actually given to the wall, cannot by any means be made to extend over the border, a coating of dry litter should be spread over it as soon as severe weather commences, and be retained on it till the opening of the spring.

Bearing in mind all that we have advanced, we request the reader's attention to the somewhat novel plan we now produce. Fig. 1 is an elevation of a highly ornamental conservative wall, which may be extended either way to any required length. The scale is one-twelfth of an inch to a foot. By referring to fig. 2, the ground plan of the same part will be seen, on a parallel scale. This shows the furnaces at the back, in the form of gratings; the flues, *a a*, which are carried underground, from one division to another; and the space for plants, *b b*. The elevation in fig. 1 will be perceived to consist of plain pillars, crowned by the chimneys connected with the flue, and by simple vases. The space between the pillars supporting the chimneys stands much forwarder than the rest, and is faced by a trellis. The receding parts can be covered at pleasure, with a glazed light or lights, which, when not wanted, can be made to slide on rails, behind the projecting portions. The rail at the back of the screen wall is shown on a larger scale, in fig. 3; and the bottom of the sliding light, with its revolving roller, is exhibited at fig. 4. A side view of the roller inserted at the base of the sash frame is given in fig. 5.



A review of the chief features of the plan will leave the following general ideas. The wall is composed of alternate prominent and retiring compartments. Each of the former includes two stone pillars, which stand out a little beyond all the remainder, and are to be left uncovered; while between these is a division, over which is extended a trellis for supporting the hardiest sorts of climbers, and those that demand no protection. The recesses are capable of being covered in cold weather with glazed sashes, which can be placed out of sight in a moment, whenever it is safe to remove them, by sliding them behind the other divisions. In these recesses, the tenderest greenhouse plants may be cultivated, and trained against a trellis which could not be shown in the engraving. Thus are combined a handsome architectural elevation, and the means of having some of the finest exotic plants exposed in summer, without danger, and in a condition incomparably more healthy and attractive than they ever attain in the greenhouse.

If the employment of glazed sashes be deemed too expensive, canvas or other screens can readily be substituted for them by the same contrivance; but then the plants will be sure to suffer from being kept in darkness during winter, and the aspect of such coverings will be by no means pleasing at that season and in spring. Where it is thought preferable, too, another set of rails, on the outside of those for the sashes, can be prepared, in order to carry some kind of covering, which may be used in rigorous weather. Should this provision be made, the necessity for flues and fire-heat will be very trifling, and they might, in fact, be altogether dispensed with. Fires are only useful to prevent the plants from being frozen; and when this can be done by a more natural method, they become worse than useless for such exotics as can be cultivated against a conservative wall.

For the benefit of persons preparing such a wall as that we have described, we subjoin brief and very select lists of the plants best adapted for each of the different compartments. We shall insert the names in alphabetical order, and refer, for the character of the species, to any botanical catalogue.

CLIMBERS THAT WILL GROW AGAINST THE UNPROTECTED PART OF THE WALL.

Acacia dealbata
Alstrœmeria acutifolia
— hirtella
Ampelopsis hederacea
Apios tuberosa
Aristolochia Sipho
Caprifolium dioicum
— etruscum
— pubescens
— sempervirens and its varieties
Ceanothus azureus
— collinus
Cercis Siliquastrum
Chimonanthus fragrans and its varieties
Clematis azurea
— florida
— montana
— Sieboldii
— viticella
— — plena
Convolvulus bryoniæfolius
Cratægus Pyracantha
Cydonia japonica and its varieties
Deutzia scabra
Eriobotrya japonica
Erythrina Crista-galli
Grevillea rosmarinifolia
Jasminum officinale and varieties
Kerrya japonica flore-pleno
Leycesteria formosa
Magnolia conspicua
— grandiflora
Mahonia aquifolium
Mimosa marginata
Mutisia ilicifolia
Myrtus communis and varieties
Passiflora cærulea and varieties
Punica granatum and varieties
Ribes sanguineum
Solanum crispum
Sollya heterophylla
Tecoma radicans
— — major
— grandiflora
Wistaria sinensis
With roses of various kinds.

CLIMBERS THAT REQUIRE A GREATER OR LESS AMOUNT OF SHELTER.

Acacia prostrata
Anthocercis viscosa
Bignonia capreolata
— Chirere
Billardiera mutabilis
Brachysema latifolia
Buddlea madagascariensis
Chironia decussata
Clianthus puniceus
Clitoria Ternatea
Chorozema cordata
— rhombea
— spectabilis
Daviesia latifolia
Diplacus puniceus
Dolichos lignosus
Fuchsia fulgens
— globosa
— lycioides
— radicans
Grevillea sulphurea
Hardenbergia macrophylla
Hibbertia volubilis
Hoya carnosa
Ipomœa Learii
— purga
— rubro-cærulea
Jasminum odoratissimum
Kennedya Marryattæ
— nigricans
— prostrata
Kennedya rubicunda
Lantana Selloviana
Leonotis Leonurus
Mahonia fascicularis
Malva Creeana
Mandevilla suaveolens
Marianthus cæruleo-punctatus
Medicago arborea
Passiflora cæruleo-racemosa
— incarnata
— kermesina
— quadrangularis
Physianthus albens
Polygala grandiflora
Ruscus androgynus
Siphocampylus bicolor
Solanum jasminoides
Sollya salicifolia
Sutherlandia frutescens
Swainsonia galegifolia
— — albiflora
Tacsonia pinnatistipula
Tecoma capensis
Thunbergia alata and others
Tropæolum pentaphyllum
— tricolorum
Zichya Molly
— pannosa
— tricolor
And several sorts of Camellia, Citrus, and Pelargonium.

The preceding lists comprise a few species which are not actually of a climbing nature, but which will bear to be treated as climbers, and will exhibit themselves favourably under such circumstances. Those kinds that are fitted only for summer display have intentionally been omitted, as we purpose enumerating them in a future article.

In the management of the above plants, some diversity of treatment will be requisite; and this must be determined by their known habits. We shall here merely give two general rules. In furnishing a wall with climbers, young plants should always be chosen, because, however desirable immediate effect may be, it must never be obtained at the cost of subsequent and permanent beauty: and unless the specimens are young and small, they can rarely be trained in the required position, and will still less frequently produce branches from the base, so as to cover the lower part of the wall. To relieve the bareness which this system will occasion, a few fast-growing species may be inserted temporarily, taking care that they do not interfere with the others, and removing them when they are no longer needed.

Our remaining direction is, that the plants be pruned and trained into the form they are wished to assume, from the time of their transplantation; and after they have filled the space assigned them, they may be permitted to grow more wildly. For the first two or three years, likewise, healthy and vigorous growth should be more sought after than flowers; since these last can be supplied from the sources before alluded to. As soon as the more shrubby kinds, such as Mahonias, Camellias, Fuchsias, &c., have covered a moderate amount of surface, their lateral branches may be allowed to stand out from the wall, that they may make some approximation to their true character of shrubs, while they perform their original purpose of covering the wall. They will thus bloom more abundantly, and have a more natural appearance; the space above them being occupied by the more rambling and purely climbing species. Close training, indeed, ought to be abandoned with all the sorts after they have reached their prescribed limits, and they should be pruned on the spur-system, or so as to induce them to protrude from the general surface a great quantity of short blooming branches.

CULTURE OF AGAPANTHUS UMBELLATUS.

At a period when the advantages to cultivators of examining, occasionally, the collections of other individuals, are so far from being generally disputed, that they are all but universally acknowledged and appreciated, it would be beyond the province of a writer in such a periodical as this to urge their consideration. Observation is only of secondary moment to experience, and will, in many instances, compensate for the want of the latter, while in all it enlarges the bounds of its action, and supplies it with materials to work upon.

Though most are agreed, however, as to the importance of visiting other gardens than those to which their labours are confined, there is a distinction to be drawn in the character of places, with regard to the kind of information to be derived from them, which few seem duly to make. Very extensive domains, for example, comprising every department of gardening, and some of these conducted on a scale and in a manner which are quite unapproachable on limited estates, are often thought to contain far more instruction for the inquiring culturist than the humbler and smaller gardens of less wealthy persons. And to some extent this view is an accurate one; for, undoubtedly, as far as landscape gardening, comprehensive plans of general management, and some of the higher branches of culture, are concerned, large gardens are, for the most part, the best schools, whether for constant or casual attendance.

If the intention of the tourist be, on the contrary, to gain hints on the culture of popular tribes of plants, or individual species, that are easily grown, and to ascertain how this class of exotics may be managed most successfully and economically, (his time not being so much an object,) he will most satisfactorily attain that end by going to a great number of small places, in nearly every one of which he will glean something of that sort which will be solidly and lastingly useful. We therefore repeat that to have the mind expanded, to obtain large and liberal views of things, and to form good notions of the treatment of plants on a grand scale, the princely gardens of the great must be frequented. But to be informed on minute particulars, to see certain plants or small groups cultivated in the best and cheapest way, and to get a thorough insight into the practical working of the modes adopted, the more circumscribed gardens of the merchant, the retired tradesman, and the country gentleman should be explored.

Lest any surprise should be manifested at our declaration of these opinions, we may state on what they are grounded. It is an admitted principle that when the attention is divided among many objects, they will all be less completely fulfilled, than if the mind had been fixed on one or two. And it is thus with cultivators. Those who have comparatively few plants to attend to, and no great variety of them, are sure to succeed better than such as have a considerable number and diversity. Besides which, the shifts to which the lesser cultivator is usually driven for want of adequate means or proper convenience, frequently elicit improved methods of treatment, and always tend to the discovery of the true capabilities of plants. At any rate, he is, of necessity, more likely to find out the readiest plan of cultivating those plants for which he has a demand.

That the foregoing observations may not appear foreign to the subject by which this paper is headed, we shall avow at once that we were directed to our notice of *Agapanthus umbellatus*, by seeing some remarkably handsome specimens in a garden which exhibited nothing else worthy of record, and which in no other way whatever repaid us for the trouble of calling.

None need be told that the species on which we are now writing is a very showy and free-flowering plant; since there is scarcely a collection in the country which has not, at least at some period, comprised specimens of it. It is mostly valued for the trifling tendance it requires, and the fine bold manner in which it produces its clusters of large blue flowers, as well as for the length of time these last. Flowering in the months of June and July, and continuing to do so till September or October, it makes a desirable feature in the greenhouse, and is largely employed for placing among the commoner greenhouse plants that are ranged round some styles of mansions, or in their recesses during summer.

Although a fast-growing plant, and disposed to attain a considerable size, its wants are rarely ministered to, and it is allowed to starve in a small pot, year after year, no care being evinced for it so long as it goes on to bear its common quantity of flowers, which it generally will do in the midst of the most unpropitious influences. As a proof of the extent to which its roots are confined, it is quite an ordinary occurrence for it to burst the pot in which it is growing, by the mere force of a natural effort to escape from such restrictions.

No plea that the plant is not susceptible of improvement by culture can for a moment justify the neglect to which it is subjected; for we are not acquainted with a single exotic that yields more ready and full recompense to congenial management. And when we assert that we believe trouble will actually be saved by more kindly treatment, and that it is a plant which anybody may cultivate, whatever be the extent of their means, there will not remain a shadow of an excuse for its being longer retained in obscurity and comparative insignificance.

The mistake that has prevailed in regard to this plant has been, that it does not merit greater attention; but had those who entertain that notion seen the splendid specimens which we saw last autumn at the place before referred to, with their noble bunches of flowers, which were nearly twice the size of the ordinary ones, and of a very much deeper and richer colour, they would immediately take a different view of the subject. The consequences of the above error have been that the plant has not been allowed sufficient pot-room, nor an appropriately rich soil, nor an annual change of the last.

To bring out all its striking characteristics, it should be planted in an ornamental tub, from eighteen inches to two feet square, and have a compost of fresh loam and decayed manure or leaf-soil, in equal quantities. So treated, it will, in two or three years, form a magnificent object for placing on lawns, by the side of porches or walks, on artificial terraces, &c. It should be partially supplied with new soil every spring, and may be removed late in the autumn to any dry shed for the winter. Where a greenhouse is possessed, it may be put in any vacant part of it, after potting, till the month of May; or a cold pit or frame will answer equally well. But it is almost hardy, and, towards the beginning of April, can be exposed without injury, provided it has not been rendered tender by being kept in a warm place. Should frosts occur after it is taken to the open air, a mat or other similar article thrown over it will be ample protection.

In the summer season, this species requires a very copious administration of water. By the system we suggest, however, the greater space permitted to its roots, and the superior richness of the soil, will do away with the necessity for such frequent supplies as it demands when in a pot. As the flowers decay, towards autumn, watering should be gradually abandoned, and in winter it must remain dry and torpid.

We hope that a plant so readily procured, and most commonly possessed, which is here briefly shown to be capable of the highest culture and beauty by the simplest means, will in future be more valued by the occupants of small gardens; and that those who have greater facilities, to whom our subject is, perhaps, of higher importance, on account of the larger demand they have for such objects, will rightly estimate the suggestions thus offered.

ON SUPPORTING PLANTS BY STAKES.

The season having arrived when plants of every description that cannot support themselves are beginning to require artificial assistance, and the manner in which this aid is furnished being mostly very objectionable, some hints which will serve as guides to both gardener and amateur, wherever they may be called upon to apply stakes to plants, will probably not be deemed misplaced.

Primary importance must be attached to the time at which support of any kind is to be afforded. The principal evils to be corrected in the methods at present pursued, are staking plants at too late a period, and doing it with unsuitable materials, or in a slovenly way. If a specimen be not early staked, however neatly this operation may be afterwards performed, it will ever betray the neglect from which it has suffered, and can very rarely be brought into the required position. Beyond this, there is the danger of being broken or injured from wind and other causes, to which it is exposed prior to staking, and the fact that it is not necessary for stakes, when timeously applied, to be so strong; when, by consequence, they are not rendered so prominent or perceptible. Let a plant be staked while it is small or young, and its appearance will remain as natural as if it had not been staked at all; but wait till it has begun to straggle, and no subsequent care will suffice to relieve it of the constrained unnatural aspect it must then be made to wear.

Whatever material be employed for supporting plants, the chief object should be to conceal the stakes; and hence they ought to be as straight and free from projecting parts as possible, and as short and slender as comports with the purpose for which they are designed. Crooked stakes, those which have irregular and broken branches, such as are unnecessarily stout or tall, and stakes made of a soft pliable wood, or having too rugged an exterior, are exceedingly unfit for ornamental uses in the case of erect-growing species. The most proper are those which are smooth, straight, free from irregularities, just strong enough to effect their object, and so long as to reach only within a few inches of the top of the specimen, or as high as support may be needed.

To the ordinary modes of applying stakes, or fastening plants to them, there are likewise many objections. It is wrong to place the stake between the plant and the path from which it is looked at; for the object that ought to be hidden is thus made most conspicuous. It is improper to thrust the stake into the earth near the stem of the plant, particularly if it be a tuberous-rooted or bulbous species; since much damage may be done to the specimen, and probably some of its main roots and sources of sustenance be cut off thereby. For the same reason, it is equally erroneous to use a stick that is not prepared with a long smooth tapering point, or has any considerable asperities on the portion that is to enter the ground.

Many consider that it is of no consequence how rough the part that is out of sight is left, so long as it can be driven into the soil without great trouble; forgetting that injury done to the roots, though not apparent to the eye, must inevitably weaken the plant. It is further injudicious, and produces a bad effect, to use too many stakes where fewer would answer the same end, or to employ too few, and tie the branches in an awkward posture.

With respect to the attachment of plants to the stakes, the capital error is, where there are several stems or branches, to tie them all together in a bundle around one stake. And next to this, to inclose a leaf or leaves, or any portion of them, between the band and the stake, is the most glaring fault. Each stem or shoot, however many, may be supported by the same stick, and ought to be secured distinctly, by itself, without encumbering any other branches, or disarranging (much less tying in) any of the foliage. Amateurs, too, generally use the matting for bands without twisting it, thus rendering the employment of a broader piece requisite, (which is, even then, not so strong as a narrower strip properly twisted,) and leaving the edges of it ragged, or liable to become so, and very unsightly. The best plan is to twist the matting itself somewhat tightly at first, then, passing it round the stem to be supported, cross it and slightly twist it between the stem and the stake, and afterwards secure it to the latter. Neatness and durability are combined in this system. But with growing plants, especially such as have tender stems, the band should, in the first instance, be tied very loosely, and be repeatedly examined to see that it does not cut the plant, replacing it where needful.

Stakes made of branches of trees that are of the proper size, ought not to be deprived of their bark; and others which are prepared from timber should be smoothly shaven, and, where practicable, painted blue or green. For small stakes adapted to low-growing hardy plants, or to exotics in pots, the young branches or suckers of the hazel-nut or filbert are well adapted. Before being used, however, it is better to place them in an oven for a short time, or keep them for a few weeks above the stock-hole of a hothouse, or in any dry warm place, in order to make them hard, and deprive them of their pliability.

Where stakes have to be applied to plants that present two faces to the view of the beholder, they may be placed indifferently on the right or left side, but never at either front; and in all other cases, they should invariably be kept *behind* the stem. A Dahlia, for instance, and a plant in a pot also, should be staked on that side directly opposite to the one seen from the walk, or most commonly visible.

One rule relative to staking plants is of universal application. If by a little pruning, or the allowable reduction of some of the shoots, stakes can be avoided, it will conduce much to the beauty of the specimens, and save a needless expenditure of labour.

FLORICULTURAL NOTICES.

NEW AND BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR MARCH.

Aca`cia platy′ptera. According to the figure and description here given, "this beautiful *Acacia* compensates for the absence of leaves in the quantity and rich yellow colour of its heads of flowers ;" which is a feature quite new to us, as the specimens we have seen produced their blossoms very sparingly. The branches of the plant are something like those of *A. alata,* but have very much broader leafy wing-like margins, and the flowers issue numerously from short lateral shoots. The specimen figured was "sent from Oakfield, Cheltenham, by Mrs. Wray, who had obtained seeds of it from the Swan River settlement." *Bot. Mag.* 3933.

Catase`tum abru′ptum. A curious species, which blossomed in the Glasnevin Botanic Garden in September, 1841, and again in October of the same year, having been received there by Mr. Moore from Brazil, through the favour of Dr. Gogarty. "At first sight a very great similarity will be recognised between this and *C. luridum.* It is possible it may be a variety ; at the same time, the greater depression of the whole perianth. and the different form of the lip, are obvious peculiarities. In *C. luridum* the two side lobes of the lip run down gradually into the apex or middle lobe, which is also considerably prolonged and reflexed. In our plant the side lobes are very distinct and abrupt, presenting a vertical edge towards the middle lobe or apex, which is, moreover, very short. In other respects the description of one will serve for that of the other." It is not at all handsomer than *C. luridum. Bot. Mag.* 3929.

Cypripe`dium barba`tum. This is a beautiful plant, with delicately-painted flowers, and pleasingly mottled leaves. It is "a native of the Straits of Malacca, where Cuming found it on Mount Ophir. Messrs. Loddiges are the only persons who have flowered it," and with these gentlemen it has been in bloom at almost all seasons, some flowers being, likewise, now opened. "The purple hairy shining warts, which border the upper edge of its petals, distinguish it immediately from *C. venustum* and *purpuratum,*" which are most like it. The upper petal is of a pale greenish white hue, most elegantly streaked with pink and bright green. It succeeds with the same treatment as *C. venustum* and *insigne. Bot. Reg.* 17.

Cynoglo′ssum anchusoi`des. More like an *Anchusa* or a *Pulmonaria* in appearance than a *Cynoglossum ;* but its fruit determines it to belong to the latter genus. Although not very ornamental, it is an interesting hardy perennial, derived "from seeds received from the East India Company, said to have been collected either in Cashmere or Thibet, and presented to the Horticultural Society," in whose garden it bloomed in May, 1841. The species has large lanceolate leaves, and spreading panicles of drooping flowers, which are pink while in the bud, and blue after expansion. It is described as "growing well in rich garden soil, and flowering freely in July and August. It is easily increased from seeds, sown in the ordinary way ; but the plants will not flower before the second season." *Bot. Reg.* 14.

Gastrochi`lus pulche′rrima. If this drawing be correct, the plant in the nurseries, under the name of *G. pulcherrimus,* must be another species, for the lip of the flower is depicted as having "a rich sanguineous spot, with two white streaks " in the middle, whereas that which we have previously noticed and figured is streaked and stained faintly with light pink. It is a fine stove perennial, and " native of Rangoon, in the East Indies, where it flowers in August." *Bot. Mag.* 3930.

Maxilla`ria crue′nta. Nearly allied to *M. aromatica,* of which we have before considered it a very fine variety. Dr. Lindley observes, however, that "the following circumstances will readily distinguish it. The leaves are broader; the flowers are four times as large when in health, the lip has quite a different form, with a deep crimson blotch at its base, and is not half the length of the sepals ; the middle lobe is rounded not unguiculate, and has only a small tubercle in the middle, instead of the large concave appendage that occurs in *M. aromatica.*" The flowers are of a rich orange colour, with a beautiful lip, which is deep reddish-brown at the base, and spotted or stained with blood-colour towards the extremity. It was introduced from Guatemala by Mr. Skinner. At Carclew, the seat of Sir C. Lemon, Bart., "one of the flower-stalks bore two blossoms, a very unusual circumstance among the species with this habit." *Bot. Reg.* 13.

NEW OR INTERESTING PLANTS LATELY IN FLOWER AT THE PRINCIPAL SUBURBAN NURSERIES.

Brachyse'ma hy'brida. Between *B. latifolia* and *B. undulata* a beautiful hybrid has been raised, and is blooming in the nursery of Mr. Low, Clapton, and Messrs. Henderson, Pine-apple Place. It shares the character of both the parent species, and is of a graceful habit, with a mixture of cream and dark blood colours in its flowers. As an early ornament of the greenhouse, it will be a very serviceable and interesting plant.

Cinera'ria sple'ndida. A hybrid bearing this name has been originated by Mr. Green, gardener to Sir Edmund Antrobus, Bart., Cheam, and we have seen it flowering at Messrs. Young's, Epsom. It partakes in some measure of the habit of *C. Waterhouseana*, but is less diffuse, and has large blossoms of a deep purplish crimson hue. It is a very splendid variety, and well deserves its title.

Cinera'ria, *hybrid.* Messrs. Henderson, of Pine-apple Place, have also several new hybrids, among which is one called the King of Prussia, which has flowers of the richest purplish crimson we have ever met with. The blossoms are rather small, but numerous, and the habit of the plant is very compact.

Dendro'bium Cambridgea'num. This exceedingly handsome species is now blossoming with Messrs. Loddiges. It grows on a suspended log of wood, and the flowers appear on the young leafy stems. They are large, of a superb orange hue, and having a lip, the centre of which is a fine dark velvety brown. The association of the bright green foliage and the showy blossoms on the same stem, which is by no means common in Dendrobia, has a very delightful effect.

Epa'cris Cra'egii. Obtained by Messrs. Henderson, Pine-apple Place, from Mr. Cunningham of Edinburgh, and evidently a hybrid. It is much like *E. microphylla* or *E. cerœflora*, and has a neat habit, with very lively little white flowers, round the centre of which the dark stamens are ranged, and greatly increase its beauty.

E'ria panicula'ta. The stems of this interesting plant grow nearly eighteen inches high, and require supporting. They are clothed with narrow sheathing leaves, and the panicles of flowers issue from their summit, depending in five or six long branches. The sepals are greenish yellow, and the petals and lip are spotted with purple. Although the flowers are small, their pretty markings and the mode of their production atone for a deficiency in size, and render the species rather desirable. It is in bloom at Messrs. Loddiges'.

OPERATIONS FOR APRIL.

April is almost proverbial for its constant alternations of sunshine and showers; and as the course of nature is, in a general way, that best adapted to the wants of the vegetable kingdom, it might be assumed, from this circumstance alone, that exotic plants require to be in some degree similarly treated. Such an assumption, being in accordance with the dictates of experience, is pressed upon the cultivator with double force.

The two main points to be regarded in the management of all plants in houses at the present season are the allowance to them of additional supplies of water, and the trifling increase of the temperature of the air in which they are grown, as the season advances. The augmented administration of water will be necessary, in consequence of the greater demand made upon the plant by the young developments, and the extra evaporation that will result from the exposure of a tender, succulent, and growing surface. Nor should these supplies of fluid be confined to watering at the roots. Syringing is, at this period, a most important operation, where plants are really in a state of advancement; as it frees the leaves of all impurities, admits of their performing fully that copious perspiration which is so essential to the proper solidification of the young wood, and ministers very materially and appropriately to their invigoration and sustenance.

To maintain an adequate temperature in houses at this time, fires may be occasionally employed for stoves, and greenhouses should be kept more closely shut up than they are at an earlier and later period. Air, except on very warm days, and when there is little wind, with the external atmosphere genial and balmy, must be sparingly given, and a greater amount of moisture should be retained within the houses.

No one will mistake the object of these directions, which are designed to render the plants vigorous and healthy at the time when their yearly growth is made; a time, it must be seen, at which the entire condition of the plant is often much changed for the better or the worse, and when the subsequent state of the specimens is permanently determined. And although some persons consider a current of air highly useful if not indispensable to a growing plant, we conceive it will be found that vegetation takes a healthy tone far more from light, heat, and moisture in the spring, requiring more air to consolidate and strengthen the new parts during summer and autumn, after they are thoroughly formed. It must not be thought, however, that we condemn the admission of air altogether during this month: we merely wish to urge the advantage of maintaining a somewhat confined atmosphere in plant structures; and air will of course be essential if the temperature rises above a moderate degree, which it certainly will under the influence of an unclouded April sun.

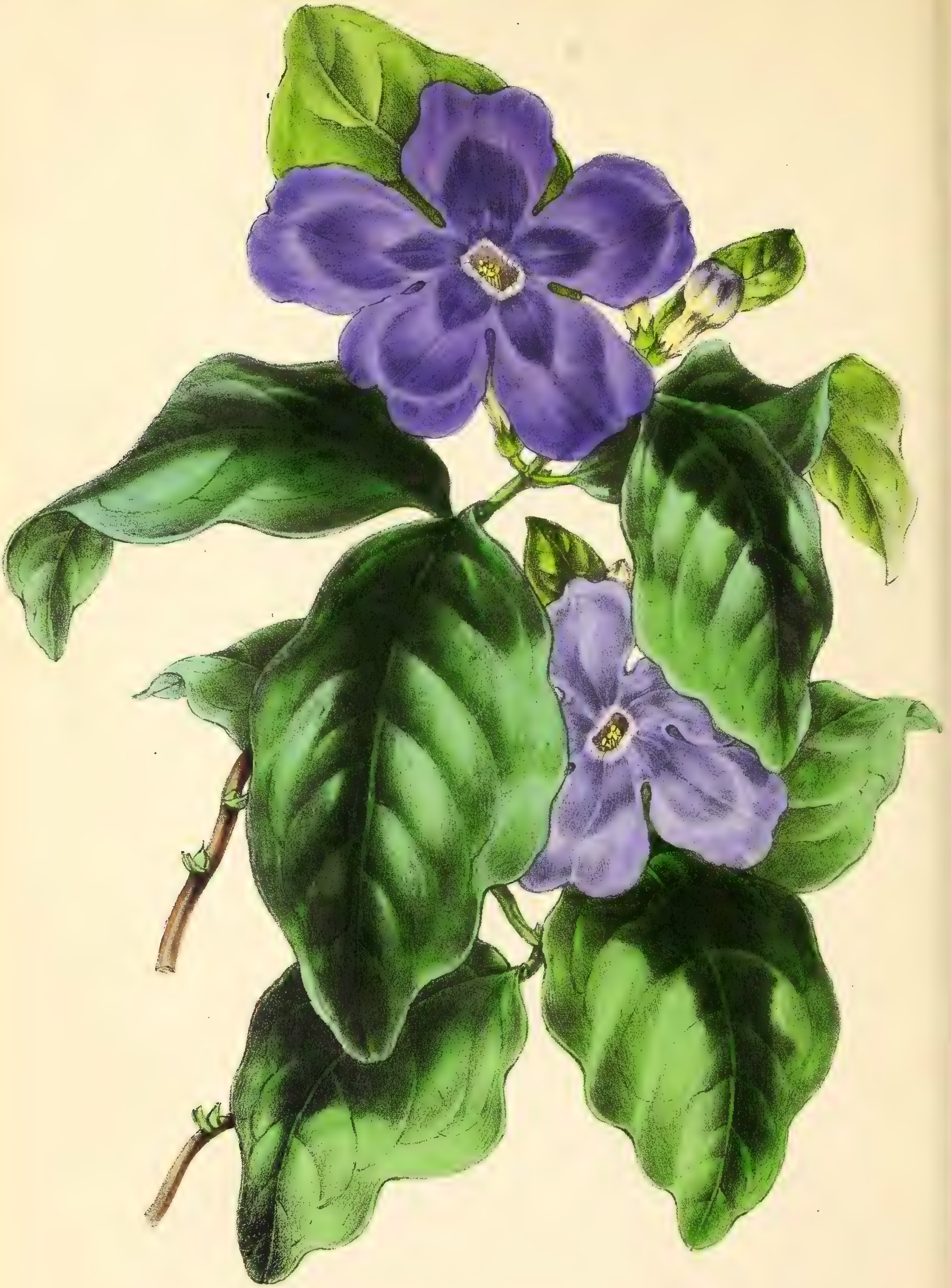
With the progress of the season, a stronger necessity will become apparent for shading such plants as Orchidaceæ. Several plans of shading are practised by different individuals. Some have the glazed portion of the roof covered thinly with a glutinous and dark-coloured wash, which will gradually wear off by the action of rain towards the end of the season, but lasts long enough to effect the purpose for which it is employed. Others stretch loose straw bands across the roof horizontally, at a distance of nine inches or a foot, and these serve at all times to throw a partial shade over the plants. Both the above systems are objectionable, on account of their shading the house during the entire day, and both in dull and bright weather. We consequently prefer a thin canvas shade, which can be rolled on or off in less than a minute when required, and has a far neater appearance.

Potting should be continued with those species that may not have been previously shifted, and also with such as have already been once potted but now demand a second shifting. The commoner leafy or stem-like kinds of Cactus may be repotted as other plants. But the round-headed sorts very seldom need shifting, as their roots are so scanty. We have had them in the finest health for five or six years in the same pot, and the specimen is frequently as large as (sometimes larger than) the pot in which it is growing. Pelargoniums, Calceolarias, and plants of similar character, must be constantly attended to with regard to potting, and be kept in a rather moist and warm atmosphere.

Plants intended for the flower-borders must be propagated, potted, or hardened, as fast as possible, and the shoots that they now make should be carefully cut off. It matters not whether these last are used for further multiplication or thrown away. The end for which they are to be removed is to cause the plants to remain dwarf, and to produce a number of lateral branches.

Specimens that have been forced and have ceased flowering, ought not to be cast aside (as is usually done) behind a wall or in some similar place, where they would be neglected, and suffered almost to perish. There should always be a kind of reserve garden and yard in which to keep plants of this character conveniently, either in frames or the open air; and in such a spot they should be carefully watered and tended till they have matured their wood, unless it is meant to discard them entirely.

Mimulus cardinalis, and the dwarfer sorts, may be forthwith divided. Most of the shoots of the former have roots at their base, and have only to be detached at once to constitute separate plants; while the shoots of the lower-growing kinds will, if laid down on the soil, and partially covered with earth, speedily emit roots, when they can be safely taken off and potted or transplanted. Annuals may be sown for succession, and the propagation of all woody exotics should be begun in earnest.



S. Holden. del & Lith.

Franciscea latifolia.

FRANCISCEA LATIFÒLIA.

(Broad-leaved Franciscea.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
SCROPHULARIÀCEÆ.

Generic Character.—*Calyx* permanent, inflated, campanulate, five-toothed; teeth equal. *Corolla* salver-shaped; limb five-parted, nearly equal; lobes rounded, repand, with incumbent anthers; tube inflated at the apex, incurved. *Style* thickest at the top; stigma two-lobed. *Capsule* ovate, two-celled, two-valved; valves indivisible; dissepiment parallel with the valves, membranous, thin, separating at the base from the parietes of the capsule at maturity.—*Don's Gard. and Botany.*

Specific Character.—*Plant* an evergreen shrub, growing about three feet in height. *Branches* short and spreading, inclined to droop a little at the extremity. *Leaves* broadly oval, acute, smooth, somewhat undulated. *Calyx* smooth. *Flowers* axillary, mostly terminal. *Corolla* very large, deep blue, changing to white.

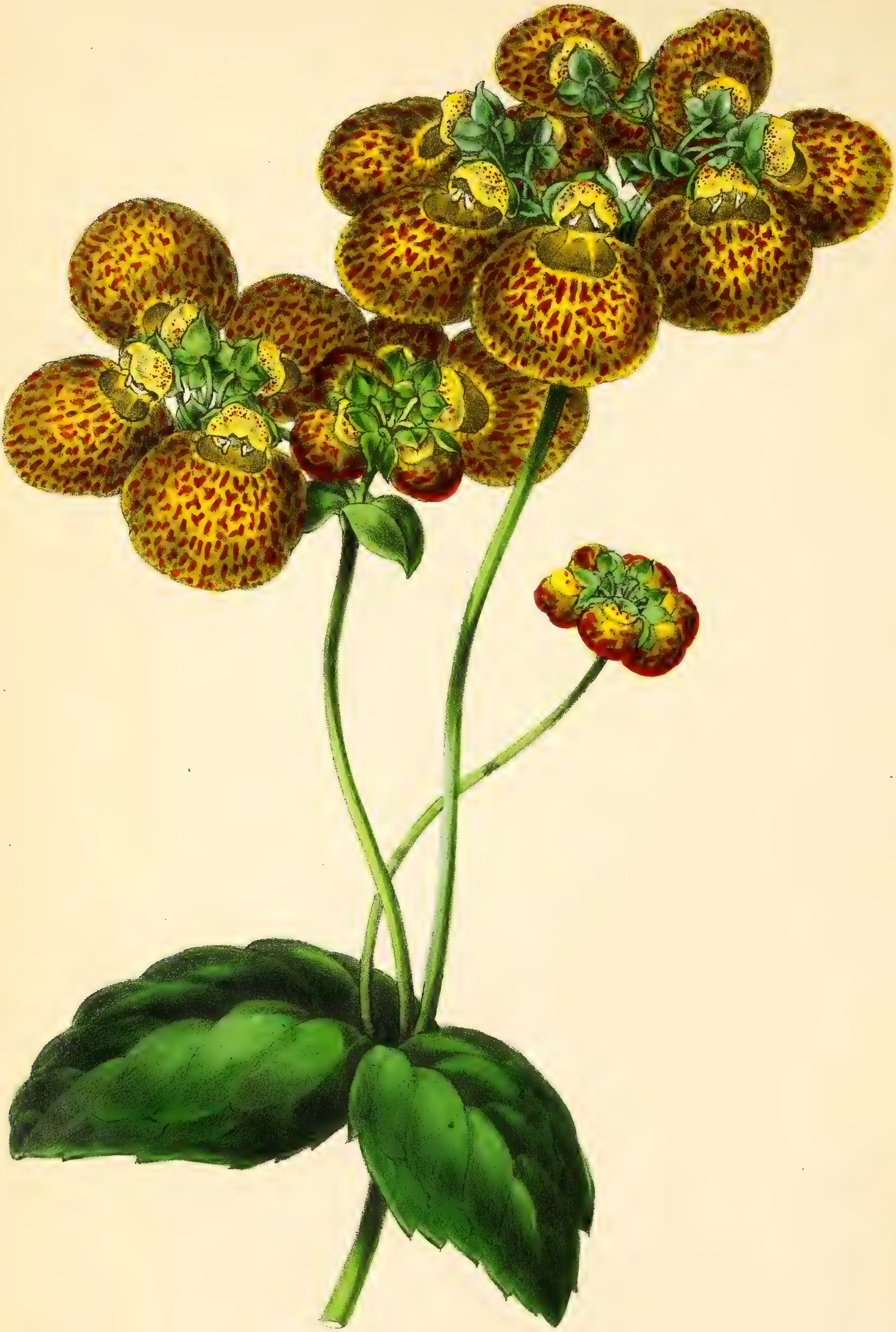
Mr. Moore, of the Glasnevin Botanic Garden, near Dublin, has the credit of introducing and first flowering this splendid species, which is a native of Tejuco, in Brazil, not far from Rio Janeiro. Plants having been sent from the above garden to Mr. Knight, of the King's Road, Chelsea, and Messrs. Henderson, of Pine-apple Place, flowered in both these nurseries in February and March last; and from Mr. Knight's, where a considerable number of plants have been reared, we received permission to have the annexed drawing executed.

All the good properties for which *F. Hopeana* is so highly esteemed, exist concurrently in the present plant. It flowers with great profuseness,—the notion that has obtained regarding the scarcity of its blossoms having originated from weakly and imperfect specimens;—the flowers are opened throughout the winter and spring months, when gaiety is so desirable in the stove; they present, on the same plant, at the same time, a diversity of colours, varying from dark blue to almost pure white; and exhale, constantly, a fragrance which is agreeable to most persons. This species has, however, additional recommendations. Its leaves are nearly twice the size of those of *F. Hopeana*, more copious, and of a richer green tint; while the flowers are, comparatively, of still larger dimensions, some being produced at Mr. Knight's which measured two inches and a half, and even two inches and three-quarters in diameter. Their colour, also, is of a far deeper blue when first developed, passing through similar changes, after the first or second day, till the blossoms become really colourless, or of a delicate white.

With such characteristics, *F. latifolia* must assuredly soon obtain a high degree of popularity; and its appropriate cultivation will necessarily be an object of some solicitude. It seems less inclined to branch—or, at least, it has yet branched less liberally—than *F. Hopeana*, and might perhaps be improved by a little early and judicious pruning. The compost in which it is potted should be light, to which end it ought to be formed of about one-half fibrous heath-mould, and the rest sandy loam, mixed with well-rotted leaf-soil or wood-ashes, and some silver sand. It is important that the plant be not in too confined a position, nor have the soil in which it grows too much shaded by other plants; and that its roots should be allowed full play by potting it frequently into a larger pot as they reach the outside. A house with a western aspect, or the shaded side of a span-roofed erection whose opposite compartment fronts the south, is in all respects the most suitable situation for it. And if there be a pit in the house, capable of containing bark into which the pot may be plunged, or filled with soil, and not very distant from the roof, so that a specimen can be planted in it, its growth in either case will be more luxuriant, for it loves a moist atmosphere, such as arises from a mass of fermenting material or of earth.

Cuttings, prepared from the partially-matured shoots, root with tolerable readiness, in a warm and humid pit, under a shaded hand-glass.

The genus was named after Francis the First, Emperor of Austria, who bestowed a liberal patronage on botany.



S. Holden del. & Lith.

Calceolaria Standishii.

CALCEOLÀRIA STÁNDISHII.

(Mr. Standish's Slipper-wort.)

Class.
DIANDRIA.

Order.
MONOGYNIA.

Natural Order.
SCROPHULARIÀCEÆ.

Generic Character. — *Calyx* four-parted, nearly equal; upper segments generally a little broader than the rest. *Corolla* with a very short tube; limb bilabiate; upper lip short, truncately rounded, entire; lower lip large, concave, slipper-shaped. *Stamens* two, inserted in the base of the tube, short; cells of anthers divaricate (one of which is sometimes sterile). *Stigma* simple. *Capsule* ovate-conical, propped by the permanent calyx, two-celled, septicidally two-valved; valves bifid; placentas adnate to the dissepiment. *Seeds* sulcately angular.—*Don's Gard. and Botany.*

Specific Character. — *Plant* a hybrid, of a half-shrubby character, with flowers beautifully blotched with reddish-brown on a yellow ground; the blotches mostly in small and short parallel stripes or streaks radiating from the centre.

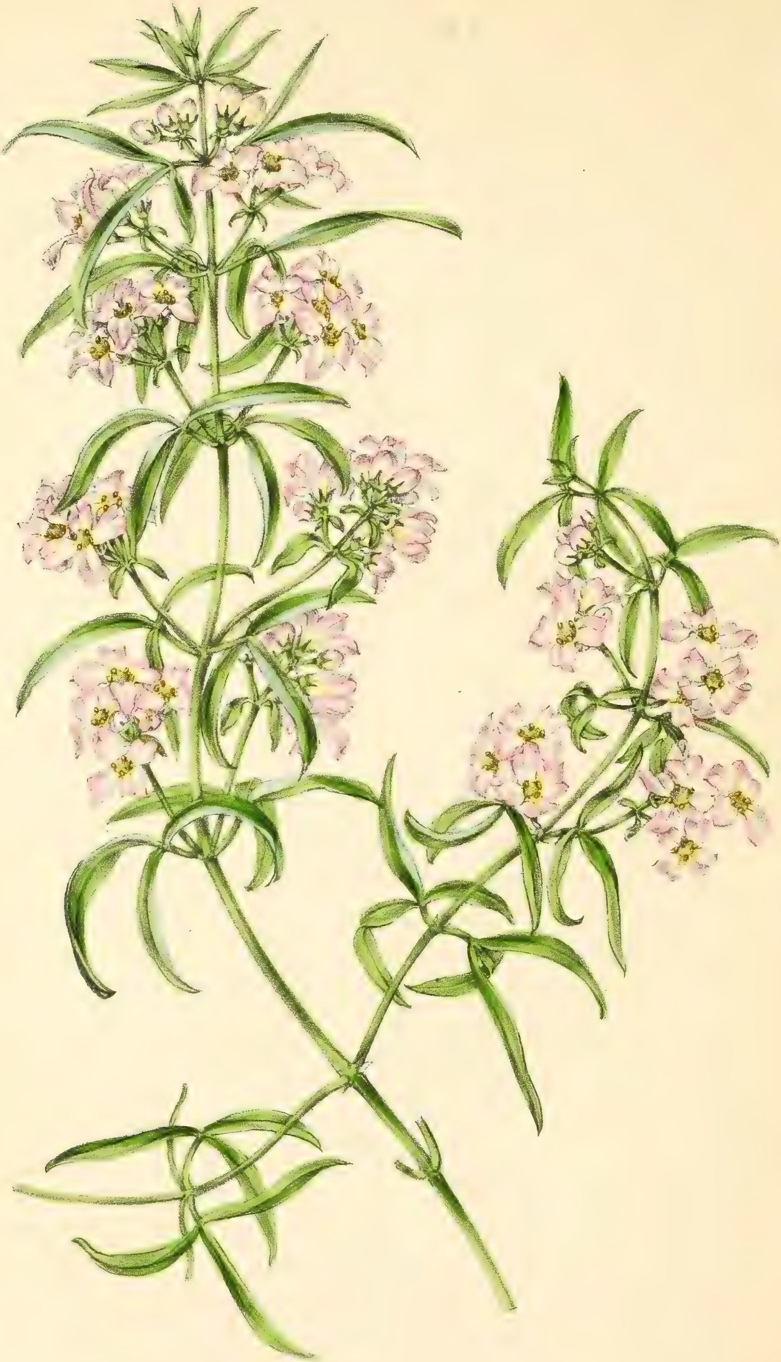
In order to render our Magazine more acceptable to those who cultivate only the most showy and easily-grown tribes of plants, we design occasionally introducing figures of new and striking seedling varieties or hybrids; still securing the interest of the more general culturist by taking care that nothing which does not merit public favour be admitted.

As an exemplification of this principle, we now publish a representation of a very handsome Calceolaria, which was raised by Mr. John Standish, nurseryman, of Bagshot, Surrey, and flowered primarily last summer, when it was exhibited at the grand show of the Horticultural Society, in their gardens at Chiswick, in June 1841. Although then only in a small state, and on this account but poorly blossomed, it seemed to us to display a character which stamps it as worthy of perpetuation.

Mr. Standish apprises us that its parentage is *C. incomparabilis* and a spotted seedling of his own; and adds that "it is subshrubby, and an excellent grower, which makes it a decided improvement on *C. Alstonii.*" The flowers are not very large; the lower lip approaches more to a circular than an oval figure; and the whole has a yellow ground, with numerous streaks and blotches of reddish brown. These blotches, as above stated, are more like irregular streaks or stripes, short, sometimes slightly branching, running nearly in the same direction, but having a tendency to radiate outwards from the centre of the flower.

Of the culture of the Calceolaria, scarcely anything needs here to be said. Cuttings of the present variety may be struck in a moderate heat about the commencement of autumn, or the latter part of the summer, and the young plants, when potted and established, can be kept in a cold frame during winter. In spring, as they increase in size, the pots should be gradually enlarged, and they will come into bloom about the month of June. If required to flower later, the first stems can be cut off soon after they make their appearance, and new ones will be protruded, which will blossom in September and October. The best compost is a sandy loam, with a small proportion of heath-soil, and an equally limited quantity of old and decayed manure. They should be watered very abundantly while growing, and often syringed over the foliage.

Calceolaria is derived from *calceolus*, a little slipper; the bottom lip of the flower bearing a faint resemblance to that article.



S.Holden del. & Lith.

Zieria lævigata.

ZIÈRIA LÆVIGÀTA.

(Smooth-leaved Zieria.)

Class.
TETRANDRIA.

Natural Order.
RUTÀCEÆ.

Order.
MONOGYNIA.

Generic Character. — *Calyx* four-parted. *Petals* four, inserted in a hypogynous disk. *Stamens* four, alternating with the petals, exserted; filaments awl-shaped, smooth, each furnished with a simple gland on the inside at the base; anthers heart-shaped, oscillatory. *Disk* surrounding the ovaries, and connected with the calyx. *Style* four-furrowed, short, smooth, terminated by a four-lobed capitate stigma. *Carpels* four, connected into a four-lobed, four-celled capsule; lobes divaricate, with a solitary, compressed, ovate seed in each cell or carpel.—*Don's Gard. and Botany.*

Specific Character. — *Plant* shrubby, evergreen, growing about a foot high. *Branches* quite smooth. *Leaves* opposite, trifoliate; leaflets linear-lanceolate, revolute, acute, smooth, longer than the petioles. *Peduncles* usually having three branches, sometimes but two. *Corolla* pinkish-white, or blush-coloured; petals reflexed.

Zieria Smithii, which has the synonyme of *Z. lanceolata*, is almost the only species of the genus with which ordinary cultivators are familiar; and is noticeable for the erectness of its habit, the denseness and stiffness of its branches, and the great number of its pretty white blossoms, which appear in February or March, and continue unfolding nearly all the summer.

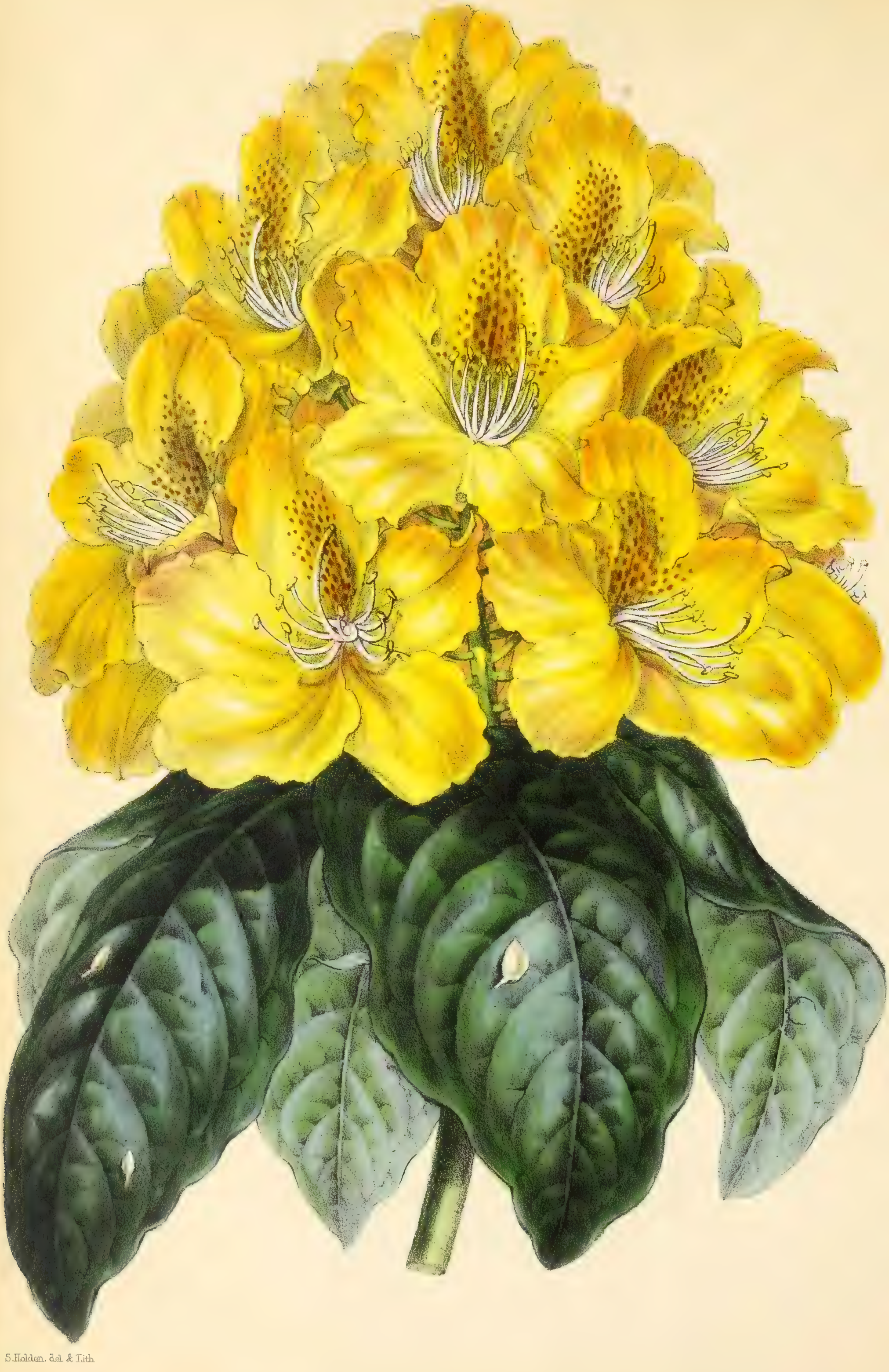
The species here figured differs very materially from that just referred to. It does not grow so tall, nor so vigorously; the shoots are neither so abundant, so strong, nor so upright, and they, as well as the leaves, are destitute of the hairiness which is apparent in *Z. Smithii*. Moreover, the flowers are arranged more in clusters, stand out better from amongst the foliage, and are thus more conspicuous, while their colour is a pale pink or blush towards the border, and whitish in the centre. *Z. lævigata*, therefore, is altogether a more graceful and elegant plant than *Z. Smithii*, although it wants its aspect of health and robustness.

In a collection of choice greenhouse plants for which Messrs. Rollisson, of Tooting, had set apart the beds of a small span-roofed house, we met with this plant flowering beautifully in April and May, 1841. The structure being a narrow one, it has a walk along the middle, and between this and the side walls, a brick pit is raised to within about three feet of the roof. The upper portion of the pit is filled with soil, and in it are placed specimens of rare greenhouse species. Although the object, in the particular instance mentioned, is, by keeping a rather high temperature, and planting the specimens in the border, to secure a greater quantity of finer cuttings for propagation, the plan, where it can be adopted, deserves imitation ; and a house so formed, filled with scarce and dwarf specimens, and varied with a few climbers which do not cover a large surface, would be a fine feature in any collection. To enliven the appearance of the interior, the sides of the walk need not be one continuous wall of brick, but the pit may be elevated on arches and pillars, as eighteen inches depth of soil would be quite sufficient.

Our subject, when grown in a pot, must have a very light and open earth, and should be particularly attended to in respect to water ; for its delicate roots speedily suffer from either a scarcity or a superfluity of moisture. It thrives well in an airy greenhouse, and though its main stem may sometimes require supporting by a stake, the branches should be permitted to assume their natural position, since they have a far more pleasing effect thus than when formally tied in an upright or any other posture. It is easily multiplied by cuttings.

The species inhabits the district around Port Jackson, in New Holland. Our figure was made at Messrs. Rollisson's, at the period already specified.

Mr. John Zier, described as a learned and industrious Polish botanist, who aided Mr. Dickson in preparing his work on Cryptogamia, is commemorated in the generic title.



S. Holden. del. & Lith.

Rhododendron Smithii aureum.

RHODODÉNDRON SMÍTHII AÙREUM.

(Mr. Smith's Yellow Rose-bay.)

Class.
DECANDRIA.

Order.
MONOGYNIA.

Natural Order.
ERICÀCEÆ.

Generic Character.—*Calyx* five-parted. *Corolla* somewhat funnel-shaped, or campanulate; rarely rotate or five-parted; limb five-cleft, somewhat bilabiate; upper lip broadest, and usually spotted. *Stamens* five to ten, usually exserted, declinate; anthers opening by two terminal pores. *Capsule* five-celled, five valved, rarely ten-seeded and ten-valved, with a septicidal dehiscence at the apex. *Placentas* simple, angular. *Seeds* compressed, scrobiform, winged.—*Don's Gard. and Botany.*

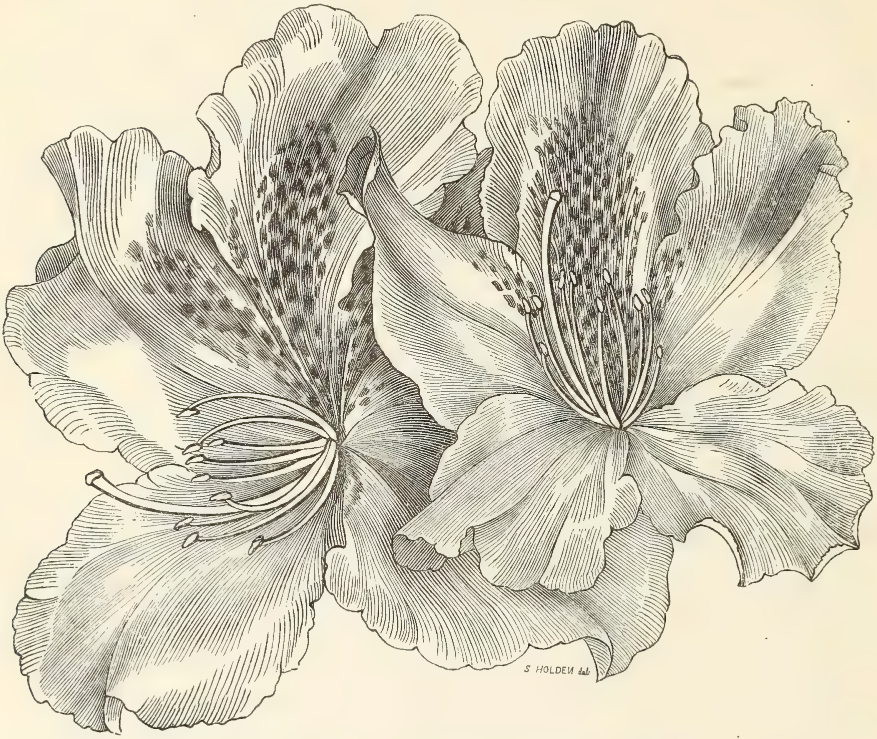
Specific Character. — *Plant* a hybrid evergreen shrub, with wrinkled leaves, and immense terminal clusters of yellow flowers, which are shaded and spotted with light brown.

This noble hybrid, which appears to be one of the handsomest and most distinct seedling Rhododendrons at present in existence, owes its origin to Mr. Smith, nurseryman, of Norbiton, near Kingston, Surrey, who procured it from a hardy seedling Rhododendron of his own, fertilised with the yellow-flowered Chinese Azalea, *A. sinensis*, and at whose request we have given it the above name.

As will be seen at the base of the drawing, the size of our plate only admits of the flowers being shown at one-third of their natural dimensions; but it will not be difficult for the observer to imagine it thrice enlarged, and thus to obtain an adequate idea of its beauty. To assist him in this, we have added in a woodcut, two flowers of the proper size, No. 1 being the variety depicted in the coloured figure, and 2 another kind, with somewhat larger flowers, which have a rather deeper shade of pinkish brown.

It was first exhibited last spring at the rooms of the Horticultural Society in Regent Street, and both there and at the Chiswick shows in May and June, attracted much attention. It is an evergreen shrub, perfectly hardy, with the foliage considerably wrinkled; and the flowers, which constitute a depressed cone, and are individually above three inches across, are of a yellow ground, shaded lightly towards the outside, especially in the upper petals, with a pale brown tint, and having the top petal profusely spotted with brown. Its flowering season seems to be May and June.

Notwithstanding its entire hardihood, it is an admirable plant for lifting when it comes into flower, and placing in a pot in the greenhouse for the purpose of preserving the delicacy of its blossoms for a greater length of time. Submitted to such treatment, it constitutes a splendid ornament to a show-house or conservatory, and may be retained in bloom several weeks.


S HOLDEN del.

Cultivated in the open ground, it demands, like other Rhododendrons, a good depth of heath-soil, and a rather shaded as well as sheltered situation. The advantage of having a great mass of bog-earth for these plants, instead of a slight superficial layer, is strongly exemplified in the extraordinary collection of Messrs. Waterer, of Knap Hill, Surrey, where the soil is naturally from nine to twelve feet thick, and the plants attain an amazing degree of luxuriance, at the same time flowering in a most astonishing manner.

Rhodon, a rose, and *dendron*, a tree, constitute the basis of the generic term; the flowers of some species having the appearance of clusters of Roses.

GARDENING AS A SCIENCE.

No. IV.

Assuming as the leading position of the theory of horticulture, that the seed is the origin and absolute nucleus of the future plant, wherein every organ and member of future developments pre-exist, though infinitely minute, we pursue the inquiry already commenced ; and shall appeal to actual experiments now in progress, but which have been repeated during a course of years with corresponding results.

The order of all the specific developments of plants is constant to the character of each individual. As enough has been stated on the germination of the seed, it will be unnecessary to refer to that prime instrument of propagation further than to remind the reader that as the vitality of a seed must depend upon the impregnation of the embryo by farina, and as that farina may be introduced from a distant plant, varying materially in character, though strictly related, varieties must be the inevitable result. Hence, the florist, acting upon the principle of hybridization, has produced those numberless beauties which become the subjects of emulation, as they are the ornaments of our horticultural exhibitions.

The culinary gardener has but too frequent occasion to lament the consequences of the intercourse between the members of the Brassica family; while some physiologists—the great Knight, for instance—taking advantage of the circumstance, and calling in the aid of science, have produced by impregnation noble varieties of the best vegetables and fruits; whence the marrow and imperial peas, the protected broccolis, the superb Elton cherry and strawberry, the monarch, Belmont, and other pears.

As seed, therefore, tends to produce variety, the modes of propagation by cuttings, layers, budding, grafting, and inarching secure the perpetuation of the one actual subject which it is the object to extend. We employ the word *extend* advisedly, because it conveys the idea of the production of parts hidden within an organization already formed, requiring only the application of appropriate means and stimulants to bring them into vital activity.

A *cutting* is a member of any tree or shrub which (whatever be its bulk or minuteness) must contain, at the least, one vital germ, or system of life. Take, for example, among trees, a twig of the apple, pear, cherry, and plum : each leaf, at its axil or angle, has a projecting point or speck, which remains after "the fall," and gradually assumes the form of a bud. This bud contains within itself the rudiments of roots, of leaves, of shoots—all or portions of which are finally developed into a noble fructiferous tree. Let the reader, in his mind, contemplate this simple yet stupendous course ; and then, we ask, can any one of all the traceable phenomena lead him to conjecture for a single moment, that a particle of the whole vast tissue has been newly *created?*

Every bud, could we know how to treat it, is capable of producing a fac-simile of its parent: but as it is not our present object to teach the art of propagation or extension, but to elucidate the science of development, we refer to the ridiculed and despised, yet truly instructive, practice of experimenting with *cuttings in water*. There are now three specimens before us, to which we will refer.

The first is the *Nerium Oleander splendens*, a plant which perhaps was propagated almost as soon as it was introduced, by placing cuttings in a bottle of water retained at the temperature of a sunny window in a warm room. In October 1841, a cutting of four joints was taken from the summit of a leading shoot, which contained the rudiments of the future corymbous flower-spike. It was cut about the one-sixteenth of an inch below a joint where there was visible a very minute bud, and immediately placed in rain-water, an inch or more deep contained in a phial. Retained in a cold vinery all the winter, it still remained green, but torpid, till February. About the same period another cutting with three conjoint shoots was taken off just below the junction of the three, was planted in mould and moss, and placed in a cold pit, where it was unprotected by anything but covers and linings of cold leaves and straw, till the first week of April. Being then examined, no radical action had taken place, and the extreme end was decayed. Thus, the freezing-point is not fatal to Nerium, either in water or earth.

The phial and its cutting were removed to a stove at sixty to seventy degrees, and placed on a rather warm shelf above a flue; and in two or three days *one white fibre* emerged on the side of, and just below, the little eye at the base, a very minute thread of granular white callus passing round the liber at *l*. As the root branched, the bud germinated, grew, and at length surmounted the old cutting: both have three leaves, but the latter has lost its flower-spike.—*a* is the stem, *b* the sprouted shoot four inches long, and *r* the masses of branching white fibres, too numerous and intertwining to be figured; they occupy a cylinder of water three and a half inches deep by two and a half inches wide.

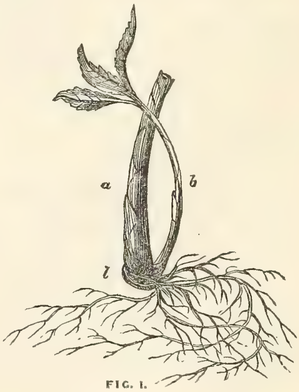


FIG. 1.

We will here impress the reader with the fact, that the *ring of callus* which precedes radification is a phenomenon restricted to the higher order of plants, exogens, chiefly: it is by no means coincident with the rooting of the lower order, as the simply herbaceous annual, and cryptogamous tribes.

A *second* example is found in *Clianthus puniceus*, which, as we shall prove on the authority of Lindley, has the quality of developing roots from the leaf-stalk without any portion of the stem adhering. (Refer to *Theory of Hort. p.* 203, *and cut.*) If a cutting of Clianthus, three or four inches long, of the wood of the past summer be taken in March or April, just below a joint, from the summit of a shoot be put an inch deep in water contained in an ounce-phial, a steady heat of seventy degrees will cause first the production of a ring of callus, and then, in a week, a complete brush of white fibres, radiating like a star from the ring. When these roots become the eighth of an inch long, the plant can be transferred to loam and heath mould, or the latter only if preferred, with greater probability of success than when the roots shall become six inches long in the water.

Thirdly, Gloxinia will root from leaves, but it is better to take two-jointed cuttings with three leaves at the summit, removing those at the intermediate joint, and passing the knife just below and parallel with the lowest joint.

The cutting being inserted, a joint deep, in a heat of seventy degrees, will in a few days develop, not a ring of callus, but a complete convexity not dissimilar to the leathery receptacle (*torus*) of a dandelion, after the pappus has been blown away. Fig. 2 will convey an idea of the node so produced: the upper part of the cutting, is taken up; but this is indifferent as to success, for the small rudimental bud at the base of each footstalk will develop a shoot. After the production of the convex process *a*, small delicate fibrillæ, of a texture so clear, yet firm, as to remind one of glass feather, gradually protrude; and when these are a quarter of an inch long, the plant ought to go into the smallest, sixty or eighty, pot of pure black heath-soil, with a little sand in the hole where the roots repose.

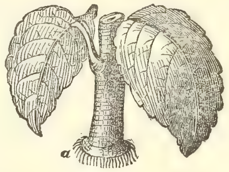


FIG. II.

This *callus* is the origin of a complete bulb, tuber, or organised system, term it what we please. The stem, therefore, in producing it, contributes its whole substance of vitality; for when the leaves fall, the stem withers, leaving a mass—a congeries of true Gloxinias, embedded like the eyes of a potato in a mass of nutrimental cellular and fibrous tissue. The cutting, therefore, of plants of this family does not produce buds, or roots from buds, but protrudes, at its base, its entire vital "organism," and in that all the rudiments of a future generation: here, then, there is continuous progression, but no new creation.

Our article shall close with a quotation from Lindley's Theory of Horticulture, p. 202—3; in the latter there are three figures (*a*, *b*, *c*,) in proof of the emission of roots by *leaves* only. "Three are figured (20), viz., Gesnera (*a*), Clianthus puniceus (*b*), Gloxinia speciosa (*c*). In these, and all such cases, the first thing that happens is an excessive development of cellular tissue, which forms a large convex 'callus' at the base, from which, after a time, roots proceed, and by which eventually a leaf-bud, the commencement of a new stem, is generated." "It is not surprising that leaves should possess this quality, when we remember that every leaf does the same thing naturally while attached to the plant that bears it, that is to say, forms at its base a bud which is constantly axillary to itself. Leaves, however, have not been often employed as the means of propagating a species; and it is probable that most leaves, when separated from their parent, are incapable of doing so, *for reasons which we are not yet able to explain.*"

We do not cite the quotation as an authority, believing the whole of the last paragraph a mere hypothetical dictum. There is no proof that the leaf ever *formed* a bud: that it accompanies a bud its situation proves; but what then? Our learned apostle of new generation must permit us to question every ambiguity, and also the validity of the assertion that the *leaf of Clianthus*, of *Hoya*, or of *any* exogen shrub, ever did, or ever can produce a plant; unless a bud situated on the *bark* of the stem be detached with it. The case is widely different with plants which deposit their whole substance in an organized tuber or bulb. There the vitality is concentrated in a mass capable of division and extension, and therefore we admit the correctness of the doctrine, in as far as the Gesnera and Gloxinia above referred to are concerned.

We shall gain our present object if we induce the inquiring amateur to experimentise with every cutting he can procure, and to watch and note down the phenomena as they occur; he will profit much, in the acquirement of knowledge, and rational gratification.

METHODS OF IMPROVING INDIGENOUS PLANTS.

Much as the wild flowers of Britain may be disregarded by the indifferent observer of nature, there are yet among them species which have no slight claims to be considered beautiful, even in their native state, and it is principally from their commonness that they are passed unnoticed. With flowers, as with other objects, that which is of every-day occurrence, which meets our gaze wherever we go, which can be obtained without an effort, and does not indicate the exercise of any kind of skill, is too frequently thought unworthy of attention, or overlooked without exciting thought at all.

It would be useless to attempt to expose the fatuity of such a course, or try to convince the heedless that they deny themselves a most certain source of pleasure; since curiosity and a taste for novelty are two of the uppermost and most natural of human emotions, and must either be ministered to, or usurp an improper and dangerous ascendancy. We prefer making it apparent that, by cultivation, British species of plants may be rendered capable of arresting the interest, and eliciting the admiration, which are so seldom bestowed on them while flourishing in their native condition.

Few take the trouble to reflect, when examining a beautiful bed of Pansies, Pinks, Carnations, double Primroses, Violets, Daisies, Scotch Roses, and various other plants, that these are essentially the productions of a British climate, although, for the most part, so improved, that their identity with the original species would hardly be recognised on bringing them together. And yet, probably, the very best of the cultivated varieties now existing will some day be as far surpassed in beauty as they at present excel the primitive sorts.

A mere glance, however, at the facts of what art has accomplished for our indigenous vegetation, ought to make it clearly obvious that a wide and almost unbounded field still lies open to the operator, and one on which his patience and talents may be exerted with the best possible effect. It is not to be conceived that any exotic species can ever be so thoroughly acclimatized as to bear the changes of our climate so well as those plants which that climate itself produces. And if our flower-borders are to be more amply stocked with a hardy and vigorous race, while we would by no means undervalue foreign accessions, we believe that the great source of supply should be looked for in our own meadows, and woods, and among our mountains and valleys.

There are three ways in which British plants may be greatly improved; viz., by planting them in a richer soil, by annually altering their position, and by propagation from seed or hybridization. In adopting the first of these plans, it is necessary to proceed with caution, and to bear in mind what is the kind of earth in which the species spontaneously thrives. Those who have been in the habit of investigating such matters, know perfectly that a common plant is mostly found in a great variety of situations and soils, and exhibits, in consequence, as great a diversity of aspect. To select only one instance; the *Myosotis palustris*, though luxuriating best in shady places, on the margins of streams or swamps, is met with in all sorts of localities, on banks, in gardens or corn-fields, at the top of dry exposed hills, in light, chalky, or clayey land; but on all open and arid spots its growth is invariably stunted, and its flowers insignificant; while in no situation does it reach the size and beauty which it attains in a moist sheltered place.

The instance thus produced, referring as it does to one of the most interesting of the British Flora, may serve to show the necessity for attending to natural circumstances. For when this species is grown in a pot,—as it often and most deservedly is,—it must be kept in a sheltered position, and have an adhesive, well-moistened soil in order to bring it to perfection.

But there are cases, and they include the majority of our indigenous plants, in which an adherence to the earth which nature provides, would, of itself, lead to no good results, or certainly to very remote ones. A rule will therefore hold, with very few exceptions, prescribing a richer soil for every native species which it is wished to cultivate highly. Yet, as the plants that have been *gradually* improved by this means would, if transferred immediately from the poor ground out of which they were taken to that which, since their amelioration, is actually requisite to sustain their fine qualities, have been rendered unhealthy, or stimulated to an undue and undesirable production of foliage alone, so it follows that it is unwise to attempt a too rapid transition from a sterile to a rich soil, and that such a process should be brought about by slow degrees. The improvement of native plants, then, through the medium of the soil, must be a work of time, and the earth can be made a trifle richer, year by year, till it is seen that a further enrichment operates prejudicially rather than usefully on the flowers. It may here be noted that the effect of moderate additional nourishment on a plant is generally manifest in the increased size and deeper colours of its blossoms, and often, finally, in their becoming semi-double or double.

To augment the benefit derivable from extra nutriment, which, however, is sometimes caused by the earth being more retentive of moisture, and not so much from its containing manure, it is an admirable plan to move the plant yearly from place to place, so that it never remains more than one year in the same spot. It is not meant that it should be taken to another garden, or to a different sort of locality; for it is easy to fix upon the kind of position most congenial, and when once ascertained it should be always secured. What we seek to urge is that each specimen be annually shifted from the precise mass of earth in which it is growing; which effected, it is immaterial whether it be taken to a great distance or merely a few yards.

We are decidedly of opinion that, on the last circumstance, the success of all experiments in gaining a superior race of plants is more dependent than on any of the properties of the soil, although these must ever be taken into account as auxiliaries. How repeatedly have we noticed the double Daisy, and other double flowers, degenerate into single ones solely from being left two years in one spot! Indeed, the shifting which we recommend may be said to constitute the chief feature in the cultivation of the plants here treated of. They get no such tendance from Nature, because they can fulfil the offices for which they are appointed without it. But when they are cultivated for display, and, after being raised to a degree of beauty to which they have before offered no parallel, descend at once to their primal condition if only neglected in this particular for a single year, it is surely reasonable to suppose that the treatment comprised in that one condition has been powerfully and mainly instrumental in improving them.

Closely associated with the annual removal of the specimens, is an operation which should be effected simultaneously therewith. It is the division of the plants, assuming them to be herbaceous species, the destruction of the central and older portions, which are becoming feeble or advancing towards decay, and the transplantation only of the young, exterior, and healthy parts. For some kinds this care may possibly be superfluous; for others it is essential; and where every aid in the promotion of the object is to be gladly seized upon, such a method must not be passed over.

The third system of melioration we have pointed out is the propagation by seed of the plants subjected to culture; and though annuals and biennials fall more beneath this head, it will unquestionably not prove irrelevant with perennials. The seed is to be selected from such plants as have been most influenced for the better by the treatment they have received, and being sown in a favourable soil and situation, the seedlings should be transplanted with care, and properly tended till they flower. The least striking of them may then be discarded, and those in which any visible improvement is manifest can be well cultivated for a year or two, and their seed again sown to be similarly dealt with. A measure of this nature will do much, in conjunction with the others we have described, to generate new and handsome varieties.

Where there is more than one species of a genus which is susceptible of improvement, cross impregnation may be added to the above mode of increase by seeds. As an illustration, we will take *Veronica spicata* and *V. chamædrifolia*, and imagine both of them placed in a somewhat nutritive soil, and shifted each spring for two or three years. At the end of that time, let the flowers of *V. spicata* be impregnated with the pollen of *V. chamædrifolia*, and the issue will most likely be a very showy hybrid, with much of the habit of the female parent, and an approximation to the larger flowers of the other. To ensure the desired result, the process may be once or twice repeated on *the same plant* in ensuing years.

Similarity in the hue of the flowers characterizes the two species thus spoken of, and hence there would be no combination of colour. The white variety of *V. spicata* might, however, have been chosen for the experiment, and in different genera the transfusion of tints may be a more prominent object. Nor should the intermixture of properties by hybridization be restricted to two British species. If a native plant possess characters which, when added to those of some hardy exotic ally, shall yield an agreeable and ornamental hybrid, the amalgamation will be quite as rational and useful.

Another way in which native species may be serviceably employed by the hybridist, is to impregnate the herbaceous sorts with the pollen of related but handsome species that are not quite hardy, thereby generating a hybrid which, with the better qualities of the exotic, combines a greater degree of hardihood. Thus, many of the tender Heaths might serve for fertilizing some of the hardier species, and a most delightful acquisition to our borders and pleasure-grounds would be gained in the hybrids to which such impregnation would give birth. Again, it is probable that the Chinese Primrose might be associated with the common Primrose or Cowslip in a hardy hybrid of great beauty; the showy kinds of tender *Anagallis* might meet with a suitable connexion in *A. tenella*, and give rise to equally gratifying results; *Wahlenbergia* (*Campanula*) *pendula*, with its noble flowers, is not perfectly hardy, but if hybridized with *C. revoluta*, or another native species, a splendid hardy hybrid might be expected; the handsome greenhouse *Oxalises* might hybridize well with *O. acetosella*, and by two or three repetitions of the process, beget not only a hardy, but a finely-striped or mottled-flowered variety. In fact, we could go on enumerating numberless similar unions that might be easily effected, and would tend greatly to the advantage of the cultivator by enlarging his stock of hardy ornamental herbaceous plants, had we sufficient space to do so.

Ere we pass away from the subject of hybridization, we must give a few examples in which we think benefit would arise from performing it on two native plants. *Digitalis purpurea* and its variety *alba* would doubtless form a very pretty hybrid, and so would *Betonica officinalis* and its white-flowered variety, under suitable cultivation. Some of the hardy Geraniums would hybridize favourably; *Saxifraga granulata*, fertilized with the charming little *S. oppositifolia*, might occasion an interesting variation; the blue and white Gentians would assuredly compose an agreeable mixture; and we are not sure that something novel might not be obtained by hybridizing Primroses and Cowslips. Especially, we conceive that Pansies would be likely to imbibe some of the fragrance of *Viola odorata*, if the seed of flowers impregnated with either the blue or white sort were duly raised. On the whole question there is ample room for experiment, and much encouragement to hope for a prosperous issue.

One consideration relative to the practice of hybridizing is of the utmost moment. All hybrids take more of the nature and habit of the female parent than the male; and therefore, where the flowers are only wished to be altered in size or colour, and the growth very slightly modified, the species in which the latter approaches nearest the desired model should be fixed upon for the female. And where, too, the intention is to blend a handsome tender plant with a less showy hardy one, in order to procure a hybrid superior to the hardy species which will endure constant exposure to the open air, the hardier of the two ought to receive the pollen of the other, and be the female parent.

Unable to furnish a list of the best native plants which we had prepared, for want of room, we shall just remark briefly on two or three particular tribes. The most extensive class consists of herbaceous species, including bulbs; and these are largely employed in decorating the margins of shrubberies, or the borders on the sides of walks that traverse pleasure-ground plantations or woods. It can scarcely be said that such plants are ever *cultivated*. They exist, it is true, from season to season, and spread abroad each summer, and are as often contracted. They are not shifted, they are not separated, except to take from them the newly-formed and luxuriant portions; and because they do not improve themselves, it is doubted whether they are capable of amelioration. Let them be placed beyond the shade of trees, when they require it, and parted and moved every year, destroying the old and weakly portions, and they will assume quite a fresh character, and rank with the best of our hardy exotics.

A smaller tribe seems formed purposely for covering miniature mounds and detached masses of rock; and we are anxious to see them more generally used. The chief of them are *Thymus serpyllum*, *Sedum reflexum* and *acre*, *Sempervivum tectorum*, and *Saxifraga oppositifolia*. We would have little grass mounds made in retired parts of the pleasure-garden for the wild Thyme, and pieces of rock laid down carelessly in the turf, in the like situations, for the other species, and let them cover these with a carpet of their singular leaves or pretty blossoms. Exotic species should not, however, be excluded from fulfilling a similar office.

The last indigenous plant of which we shall speak is the Hop, *Humulus Lupulus*, which, attached to a pole fourteen or fifteen feet high, and standing either in a border or on a lawn, makes throughout the summer a most elegant appearance, as well before its curious flowers are developed as while they are in full perfection. In the districts where it is not generally cultivated, it is a very great ornament to the pleasure-grounds.

If the application of the foregoing remarks be confined to indigenous species, our object will be only half effected. Exotic herbaceous plants will be equally benefited by the adoption of similar expedients.

BASKETS FOR ORCHIDACEÆ.

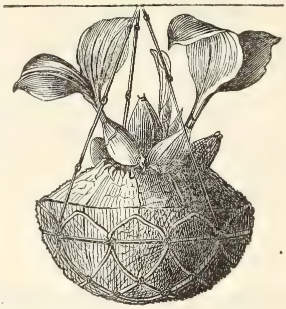
Diversified as are the materials in use for supporting Orchidaceæ, and equally various as are the modes of employing them ; although, besides, each cultivator, for a time, feels himself bound to particular systems, until he thinks he discovers a preferable plan, when he at once discards his former favourites; there are certain forms of beauty, and sure principles of utility, connected with this question, which cannot be departed from without infringing sadly on good taste, and occasioning injury to the plants. They who, for the sake of variety, or from mere caprice, imbibe and act under the impression that the most grotesque and singular objects accord best with the extraordinary character of the tribe, and are thus led into extravagances which outrage all propriety, and are as remote as possible from any relation to the peculiar habits of the species, take a decidedly erroneous view of the case, and defeat their own ends.

What ought to govern and direct every effort of the kind are, the known natural condition in which the plant is found, the desire to provide adequately for its wants with an eye to the changed circumstances in which it is placed, and the wish to exhibit favourably all its peculiarities, not concealing or eclipsing them by rendering its receptacle more remarkable and attractive than itself. On the last point we would especially insist ; because, though not of more real moment than the rest, it is far more commonly forgotten.

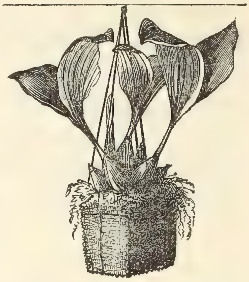
To put a small though pretty plant in an ornamental and curious basket which probably exceeds its own dimensions, is to draw away the attention from what it ought to be allured to, and to make that a leading and engrossing feature which should be nothing more than a subordinate one. Always keeping this fact in mind, however, a neat and appropriate basket will contribute greatly to set off the beauty of a plant, and a judiciously-chosen variety will be of considerable importance in an orchidaceous-house.

With the view of better elucidating the subject, we shall insert sketches of three kinds of baskets, all of which are excellent in their way, and which have our unqualified praise. Nos. 1 and 2 are novelties, which we owe to the kindness of Mr. Hammond, gardener to J. Clowes, Esq., of Broughton Hall, near Manchester. They consist of solid masses of heath-mould, of a sort of light chestnut colour, and very fibrous texture, enclosed in frames of copper wire. They are neatly cut to the shape of the wire frame, and the top surface curves upwards from the edge to the margin of a circular cavity in the centre, which is made for containing the plant. It will be observed, that the upper edge of the basket is slightly ornamented with wire, and not left plain, as is too generally the case, to look like an inverted rat-trap.

No. 1.



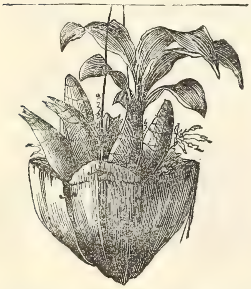
No. 2.



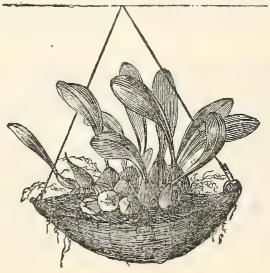
Mr. Hammond states that "this mass of compressed vegetable matter is composed of the partially decomposed parts of the various plants which now clothe its surface; such as Hypnum, Sphagnum, Narthecium, Vaccinium, Andromeda, Empetrum, and Ericas; and no doubt the present accumulation has been of some thousands of years' standing. The substance is soft and spongy, and the roots of Stanhopeas, Gongoras, Sobralia, and Ponera—indeed, some of the Pleurothallis tribe, luxuriate in it to perfection. The vigorous and healthy state of the above genera at once indicates that these subjects are at home."

It is obtained from a place called the "White Moss," in the neighbourhood of Manchester, and had to be sought after somewhat assiduously before it was discovered. To guide others in seeking it on those wastes where heath-soil is usually procured, we may observe, that it is of nearly a uniform texture—light and open, in consequence of being rather half-decayed vegetable fibre, than of an earthy consistence, and neither black nor containing any distinctly perceptible portion of that clear white sand or grit which abounds in heath-mould. We have little hesitation in affirming that it might be found on any extensive heath or common where peat abounds, and as little doubt that these baskets would suit most Orchidaceæ that are grown in soil of that description.

No. 3.



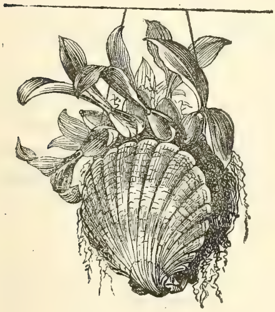
No. 4.



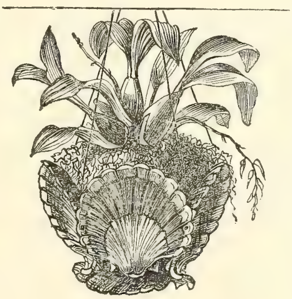
The two accompanying receptacles, Nos. 3 and 4, were taken from Messrs. Loddiges' very varied collection. These gentlemen have probably tried every device of this sort that has been thought of, and originated not a few; and they assert that the basket No. 3 is the best for Coryanthes, Catasetum, and analogous plants, they have ever adopted. It is made of the *husks* (not the shells) of the cocoa-nut, these being split into halves, slightly dressed round the edges, and fastened together with copper wire. The loose manner in which they are attached at the sides and bottom allows ample space for the discharge of superfluous water; and the interior being of an open fibrous nature, admits of the roots adhering to it readily, and even penetrating it. In external appearance, too, it is calculated to produce at least a right impression. The colour and surface strictly resemble those of wood,—than which nothing is a more natural or proper material,—and there is neither about them too great rusticity or polish, but just that degree of quietness and neatness which is or should be the prime desideratum.

In fig. 4, which is a single piece of the same material, and in an altered position, there is less to commend, and Messrs. Loddiges tell us that it demands more attention, on account of the extremes of drought and wet into which it is liable to fall. It is the half of a cocoa-nut husk, with the upper part a little smoothed and shaped with a knife, so as to appear like an exceedingly shallow miniature representation of a boat. It is only adapted for small plants, as Pleurothallises, the lesser Dendrobia and Maxillariæ, Sophronitis, Cœlogyne, &c. To remedy its defect regarding the absorption of water, it should be perforated through the bottom in two or three places, when fluid can be more liberally supplied.

No. 5.



No. 6.



The baskets sketched in figs. 5 and 6 have more pretensions to ornament, and are well fitted pleasingly to enliven an orchidaceous-house. The shells of which they are constructed can be had, for a mere trifle, of any large fishmonger. They were first brought into use by Messrs. Loddiges, but our figures are due to Mr. Edmonds, gardener to his Grace the Duke of Devonshire, Chiswick. Fig. 5 shows a pair of shells attached firmly but not very closely at the base with strong wire, and similarly fastened about half-way up each of the sides, yet so loosely as to let them expand two or three inches at the top. The basket is then, like those last described, filled with turfy heath-mould, and any small species is planted in it. A small quantity of *Lycopodium denticulatum*, placed in the earth, and permitted to hang over the edges of the basket, adds much to its effect, on account of the contrast of colour. No such assistant must, however, be suffered to usurp the place and the importance that belong to the object of primary culture, and it should be reduced whenever it gets inconveniently large or rambling.

To ensure a pleasing diversity both of colour and shape, the basket shown in fig. 6 comprises a greater number of shells, and has them arranged with their inner surface exposed to view. The same sort of wire affixes them to each other, and one shell, laid flatly, constitutes the bottom of the basket. This latter is not only necessary to hold out the side shells in their proper places, but accomplishes the purpose of enlarging the basket. Of course, the shells could be as easily placed with their convex side outwards, and so form another pleasing variation ; or, in this case, an additional row of shells could be put above the lower one, and thus a very capacious receptacle be prepared.

In the baskets made of shells, as in those composed of cocoa-nut husks, great facilities are afforded for drainage by the impossibility of disposing them so near to one another as to leave no apertures ; and if they are put together lightly, such apertures will answer every desired end. We are convinced that all the receptacles here portrayed accord thoroughly with the principles laid down at the beginning of our paper, and that the cultivator will do well to copy them, either as they are, or in a modified form.

FLORICULTURAL NOTICES.

NEW AND BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR MARCH AND APRIL.

Aca'cia di'ptera ; *var.* erio'ptera. Distinguished from *A. diptera* in having its leaves clothed with a soft velvety pubescence, and from *A. platyptera* by the hairs of the latter being less regular and occasionally harsher, by the stipules of the same being somewhat spinous, and by the heads of flowers in *A. diptera* being larger and of a paler yellow. Mr. James Drummond collected seeds of it in the Swan River Settlement, and sent them to the Glasgow Botanic Garden, from whence plants were forwarded to that of Edinburgh, in 1840. It is a curious as well as pretty species, and deserves cultivation. *Bot. Mag.* 3939.

Achime'nes longiflo'ra. Properly regarded as the handsomest plant that has been introduced by the Horticultural Society for the last twenty years, notwithstanding the many beautiful things for which our collections are indebted to that body. "More beautiful than the gayest of our stove herbaceous plants, as easy to cultivate as the commonest of perennials, more prodigal of flowers than the finest of the Gloxinias, ever blooming, except during the few months when it sinks into its winter's rest, this *Achimenes longiflora* is an invaluable gift by the Society to every one who has a warm greenhouse." The stems are described as being of two kinds ; "some creeping along the ground and amongst the soil, and forming fibrous roots and numerous imbricated buds resembling scaly bulbs ; others growing in an upright position from a foot to two feet in height, branching, and covered with short spreading hairs." "The tube of the corolla is about two inches long, and the border nearly two inches and a half in diameter, five-lobed and nearly round, having much the outline of a good Heartsease." The roots should be kept quite dry and free from frost in winter, be potted in spring in a rather rich open soil, and afterwards well watered. It blooms constantly from August to November, in a warm greenhouse or cool stove.

Catase'tum Wa'ilesii. The genus *Catasetum* is quite remarkable for the odd forms of its flowers. "In the present instance, the most striking peculiarity is to be found in the anther-case, which, instead of being carried out into a very long point or beak, is singularly short and flattened, in the centre of which is an umbo or elevated tubercle, and beneath this, a pretty large, membranaceous, spreading scale." The uniformity of this character in all the flowers leads Sir W. J. Hooker to the conclusion that it is not a mere sport, and the species is dedicated to G. Wailes, Esq., of Newcastle-on-Tyne, "a most enthusiastic lover and student of natural history, and particularly of horticulture and botany." It was obtained by that gentleman from Honduras, through the kindness of G. U. Skinner, Esq. The flowers are large, and of a green or greenish-yellow tint. *Bot. Mag.* 3937.

CLE'THRA QUERCIFO'LIA. A very fine greenhouse shrub, with large evergreen oak-like foliage, and exceedingly copious terminal racemes of white flowers, which are larger than those of most species, and deliciously fragrant. It inhabits the district in the neighbourhood of Jalapa in Mexico, and flowered with the Honourable and Very Reverend the Dean of Manchester in March 1841. "It is not hardier than *C. arborea,* and requires the same treatment, growing freely in any good garden soil which is rather light. It is easily increased either by layers or seeds." *Bot. Reg.* 23.

COLOCA'SIA ODORA'TA. More commonly known as *Caladium odoratum,* and being of an arborescent character, with noble cordate leaves, and fragrant though not richly-coloured flowers, it is an ornamental stove plant. It blooms annually in the stove of the Glasgow Botanic Garden, where "the stem or caudex is full six feet high ; the petioles springing from the top of this are not less than two feet long, and then bear a blade measuring three feet or more in length. It is a native of Pegu, and was first described by Dr. Roxburgh, and introduced to the stoves of this country by Lord Caernarvon, at Highclere." The blossoms are opened in March and April, and are included in a green hooded spathe, like those of *Arum. Bot. Mag.* 3935.

ECHEVE'RIA RO'SEA. Messrs. Lee and Co., nurserymen, of Hammersmith, imported this species from Mexico, and having presented it to the Horticultural Society, it flowered in their garden in April 1841. "From *E. gibbiflora* its short compact inflorescence distinguishes it, as well as the yellow flowers with rose-coloured bracts, which render it very gay. There is, indeed, but one species yet described in which the corolla is yellow, and that being the old *E. cæspitosa,* is a quite different stemless plant." It should be grown in a very light greenhouse, and carefully as well as sparingly watered. "It strikes readily either from leaves or from cuttings." *Bot. Reg.* 22.

GLOXI'NIA SPECIO'SA, *var.* MACROPHY'LLA VARIEGA'TA. Broad and richly-variegated leaves, with a peculiar luxuriance of habit, and flowers of an unusual size, and superb violet-purple hue, isolate this splendid variety ; which "was sent to Messrs. Veitch, Mount Radford Nursery, Exeter, by their collector, from the Organ Mountains of Brazil. It produced the noble cluster of flowers represented in September of the same year, when it was exhibited at the Horticultural Society, and obtained the certificate of merit." The foliage is much larger than that of *G. speciosa,* "and mottled with whitish green about the veins, which considerably enhances the beauty of the whole object." *Bot. Mag.* 3934.

MI'NA LOBA'TA. "Take away the flowers of this beautiful plant, and no one would suspect it to be anything more than some common *Ipomœa ;* but remove the leaves, and it loses all appearance of the Convolvulaceous order, so unusual is it among such plants to have racemose flowers, erect, and arranged almost in the scorpoid manner of a Borage ; to say nothing of the uncommon form of the corolla, and its peculiar colour, at first rich crimson, but changing through orange to pale yellow as the blossoms unfold." It is a very showy annual climber, which was first brought to England last year by G. F. Dickson, Esq., who presented a packet of seeds to the Earl of Burlington. It was raised in his lordship's garden at Holker, and afterwards given to the Horticultural Society. Being an annual, only two or three seeds were saved, and these, it is feared, were too imperfectly ripened to germinate. The foliage is three-lobed, of the shape of fig-leaves, and the floral racemes are long and graceful, bearing the pretty blossoms only on one side. *Bot. Reg.* 24.

OREODA'PHNE BULLA'TA. Formerly belonging to the old genus *Laurus,* from which this and other species have been detached. It is the "African Oak" of the Cape of Good Hope, and in the Cape Colony, where it is spoken of as "handsome, and resembling mahogany both in colour and quality ; chairs, tables, and other furniture are made of it." In our greenhouses it does not grow higher than four or five feet, and has fine leaves, which have, at the junction of some of the veins on the under side, "deep pits or hollows, ciliated at their edges, and exhibiting on the upper side corresponding elevations, whence the specific name is derived." The flowers appear in half-drooping racemes, and are minute, green, and scentless. *Bot. Mag.* 3931.

Oxa'lis lasiope'tala. From the neighbourhood of Buenos Ayres and Monte Video, seeds of this species were sent to the Glasnevin Botanic Garden, Dublin, by Mr. Tweedie ; and these having been germinated by Mr. Moore, the plants have since flowered. "It blossoms readily in the greenhouse, and its copious bright red-purple flowers render it a very desirable plant." It has tuberous roots, numerous radical leaves, the leaflets of which are obcordate and two-lobed, smooth above, and pubescent beneath. The flowers are not large nor very conspicuous, but particularly abundant. *Bot. Mag.* 3932.

Saussu'rea pulche'lla. "To those who cultivate hardy herbaceous plants, this is one of some interest, resembling a *Liatris* in colour and general appearance." Mountainous pastures beyond Lake Baikal, and moist meadows in Davuria, near the town of Nertschinsk, are the stations in which it has been found." It has pinnate scabrous leaves, grows from one to two feet in height, and bears its fine purplish heads of flowers on the summits of the branches, after the manner of a *Liatris.* "In cultivation it is a hardy pretty perennial, requiring the same treatment as the more delicate species of *Centaurea* or *Rudbeckia,* and flowering freely in the open border during the months of August and September. When planted in the open border, it is generally short-lived, owing to its blooming excessively, and therefore it is better to raise it from seeds frequently in order to keep up a succession of plants." It was raised in the Horticultural Society's Garden, from seeds sent there by Dr. Fischer of St. Petersburgh. *Bot. Reg.* 18.

Styli'dium Brunonia'num. "One of the prettiest of the singular Styleworts of Swan River, remarkable for the fine bloom that overspreads all its parts, and for the whorls of leaves which surround its flower-stem." This last appears very vigorous, tall, and exceedingly productive of fine deep pink blossoms. In its wild state it is quite peculiar. After the first year the flower-stem perishes, and leaves only the radical foliage. These leaves themselves die in the second season, when a new stem rises, and, at the height of about an inch, bears another tuft of leaves, proceeding thus every year till the plant exhibits a long upright stem, with the foliage at its summit. This growth has not yet been made in England. *Bot. Reg.* 15.

Thu'ja filifo'rmis. It seems to be the common belief that this scarce species is the same as *T. pendula ;* but "the fruit of *T. pendula* is four times as large as this, and has six scales instead of four, with scarcely any mucro ; while in this there are constantly four scales only, and they have a mucro almost as long as themselves." Hence Dr. Lindley regards it as a distinct species. "It is a beautiful and quite hardy tree, with long slender weeping branches." *Bot. Reg.* 20.

Tricho'sma sua'vis. At first considered a species of *Cœlogyne*, and called *C. coronaria.* It differs, however, from Cœlogyne "in the projecting foot of the wingless column, in the singularly fleshy anther, and in the eight pollen-masses." Mr. Gibson, collector to his Grace the Duke of Devonshire, who brought it to Chatsworth from the East Indies, observes concerning it, that "it inhabits the Chirra district of the Khoseea, and grows upon trees in densely-shaded woods near the summit of the hills. It has a strong perfume, somewhat resembling Melic-grass, on which account it is highly esteemed by the wood-cutting natives, who are fond of adorning their hair with its blossoms. It is growing at Chatsworth luxuriantly upon a block of wood, the interior of which from decay has become hollow, and is now filled with dead and living vegetable matter, the latter consisting of the roots and stems of live native Ferns, which are luxuriating with this and other Orchidaceæ on the same block of wood." The flowers are white, with a white lip, which has a yellow blotch in the centre, and a few streaks of reddish purple. *Bot. Reg.* 21.

NEW OR INTERESTING PLANTS LATELY IN FLOWER AT THE PRINCIPAL SUBURBAN NURSERIES AND GARDENS.

Aca'cia urophy'lla. A singularly upright-growing species, with irregularly-formed, entire leaves, which are very abundantly reticulated with prominent veins. The flower-buds appear a considerable time before expansion, and are in erect racemes, the blossoms being arranged in a globular manner, and having a deep orange colour. It is a handsome and peculiar species, and has just opened its flowers with Messrs. Young, of Epsom, who obtained its seeds from the Swan River Colony.

Bego'nia crassicau'lis. Mr. Hartweg, the industrious collector of the Horticultural Society, has introduced this new species from Guatemala to the gardens of that body, and it has flowered most profusely in the present spring. It is remarkable for having very thick, varied, and succulent stems, from the sides of which, near the top, and before the development of leaves, immense quantities of pretty white flowers are protruded. It is both singular and interesting.

Bego'nia vitifo'lia. Another but very different species, procured by the Horticultural Society from the same source, and flowering at a similar season. Its leaves are very much the shape of those of the common grape-vine, and the flowers are produced in spreading panicles. They are white, and have a lively appearance in the stove during spring.

Combre'tum macrophy'llum. A species to which this name has been applied in gardens on account of its large and broad foliage, is now flowering in the stove of Messrs. Rollisson, of Tooting. It is an evergreen climber, and the flowers are borne in the same way as those of the old *C. (Poivrea) coccineum ;* but the racemes are less branching, and the blossoms are far more dense. These last are of a brilliant carmine colour.

Dendro'bium Piera'rdii latifo'lium. From the well-known *D. Pierardii* this very handsome variety is distinguished by blooming a month or six weeks later, and by having much stronger stems, larger leaves, and flowers of nearly twice the size. It is an exceedingly desirable acquisition to an orchidaceous-house, and is blossoming finely with Messrs. Loddiges.

Eupho'rbia Bryo'nii. A plant bearing this title has a very gay aspect in one of the stoves at Messrs. Rollisson's, Tooting. It is not far removed from *E. splendens*, which it resembles in the stems, leaves, and flowers. The foliage is, however, better and more conspicuous, and the blossoms are of a far intenser hue. Associated with *E. splendens*, it is a beautiful object, and blooms almost throughout the year.

Habra'nthus prate'nsis. This valuable early-flowering bulbous plant is in bloom in a greenhouse at Mr. Low's, Clapton. In habit it approaches the species of *Amaryllis*, and the flowers, borne on a stem about a foot or eighteen inches in height, are of a bright red tint, with a light greenish centre and stripes. It is quite an ornamental plant.

OPERATIONS FOR MAY.

The principal transplantation of tender flowers that are to decorate the flower-beds and borders during summer will have to be effected this month, if the weather be propitious. To prepare and inure them thoroughly, therefore, and in adequate quantities, becomes a work for immediate attention. Propagation may yet be carried on, if enough plants are not already possessed ; and cuttings now put in should be struck rapidly, potted as soon as they have made roots, and transferred soon after to a cold frame, there to await their final allotment.

Whatever stock may have been before raised, ought to be rendered as hardy and robust as circumstances will permit, and be exposed at all times when the wind is not keen, and there are no symptoms of frost. Wherever weakliness is induced, by too close confinement, or by neglecting to cut off the young shoots if they grow more than two or three inches long, it must be considered that the plants will be much more susceptible of injury after being planted out, and that the check they will necessarily have to sustain will cause a considerable retardation of their flowering season, and prevent them from so soon (or from ever) acquiring vigorous health. Especially should the shoots of the branching species be carefully kept stopped, to give them a due bushiness of character, and a proportionate augmentation of flowers ; for, where one flower or bunch of flowers would crown a shoot that now exists, the same branch, if timely cut off, would protrude six or more laterals, each bearing an equal number of blossoms to that likely to appear on the original shoot.

While transplanting tender exotics, the operator is rarely sufficiently careful, and if the roots are buried in the earth, and all seems fair and smooth on the surface, little else is thought of.

The process should, however, be performed with as much skill and nicety as if the specimen were being repotted, since the effects of the two shiftings are precisely identical. The plant ought to be taken cautiously from the pot, divested of its drainage materials, its outer roots loosened and spread out regularly and deliberately, and the soil placed around them as if they were intended to live and flourish, and not merely to be interred. A few Laurel or Spruce Fir branches, stuck in the ground on the exposed side, will serve to ward off sun or wind, should either be too powerful; and on frosty nights occurring, a flower-pot can be inverted over each plant. Where the depredations of slugs or snails are feared, two or three leaves of the Lettuce, Cabbage, or other succulent vegetable, strewed on the ground near the specimens, will be sure to attract such vermin, and they may be taken on the under side of these early every morning. The leaves can be renewed when they are eaten or withered.

For planting out tender annuals, or thinning the hardy ones that have been sown in the borders, let showery weather be chosen, and do not allow the clumps to contain more than three or four plants. The former number is the best, and all others that are suffered to remain will tend to make the whole weak and imperfect. Half-hardy annuals should still be sown, both for flowering in pots, and for external display late in the autumn. For this end, too, a few of the best hardy species may also be sown.

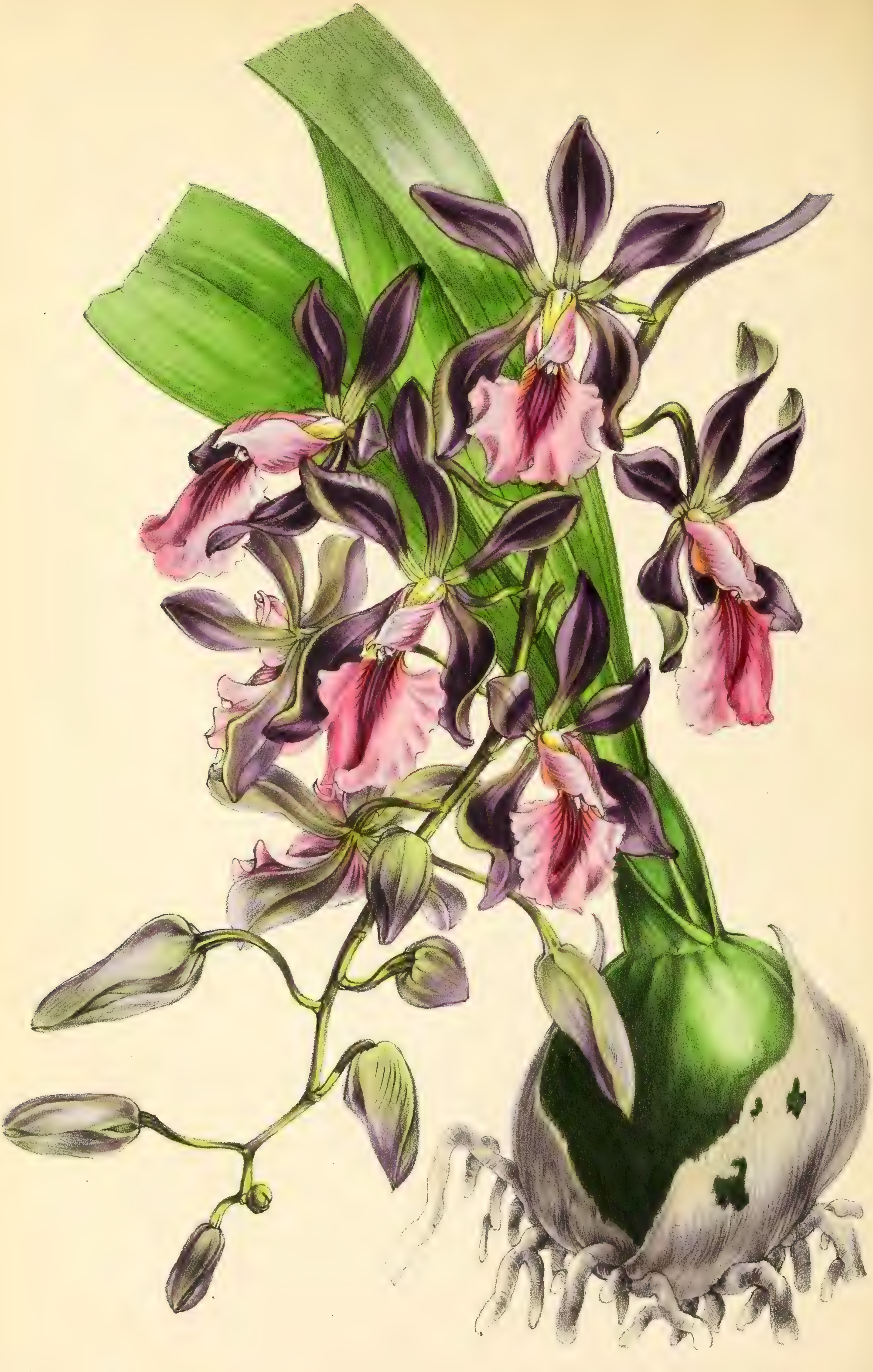
All plants that have ceased flowering in the borders should have their withered inflorescence removed; but on no pretext ought the leaves to be taken off or cut down. Many persons cut over the foliage of their Crocuses and early-blooming bulbs level with the ground as soon as the flowers have departed; forgetting that it is through the leaves alone that they can mature their growth, and be fit for flowering in the succeeding year. Others remove, with similar severity, all the green and upper portions of their herbaceous plants directly their bloom is over, because they fancy it has a slovenly look. Such a practice is quite as grossly erroneous; and, were the flower-stalks and decayed leaves alone taken away, the rest would rather adorn the border than render it untidy.

We cannot sufficiently enforce the truth that it is barely possible to stake tall-growing plants at too early a period. Dahlias, for instance, should be staked almost immediately after planting, and no specimen, however strong, ought to get more than four or five inches high without being staked; provided, of course, that operation is at all needful. No effort will recover a plant when it has once grown unshapely.

Greenhouse and stove species, and all other exotics grown beneath glass roofs, are now, for the most part, in the height of their developments. The temperature ought, therefore, to be maintained a little higher than usual, the atmosphere should be more moist, larger supplies of water should be given to the plants at the roots, they should be syringed more freely and constantly, and every specimen be repotted as often as the roots reach the edges of the pot, unless it be intended to retain it in a stunted state, or oppose its further growth. Slightly enrich the soil of such plants as Gloxinias at each potting, or give them occasional applications of manure-water. Let Hydrangeas, likewise, be watered with some enriched fluid; and also Primroses, Polyanthuses, and Carnations that happen to be in pots.

For Orchidaceæ, daily shading will be requisite, and they should be vigorously excited both by heat and moisture. Azaleas, that are in flower, will need an abundance of water. The Camellia-house should be kept rather close and warm, and the plants very copiously watered as well as syringed. Rhododendrons, too, demand an immense quantity of water while they are in blossom. Pelargoniums and Calceolarias, which are beginning to show for bloom, ought to be well watered, and placed in larger pots if they require it. Great care must be exercised in potting, or otherwise tending them, that sudden checks are not given to their advancement, since these would effectually hinder them from flowering finely. Water must be administered largely to tall and blooming Cacti at this season; and the dwarf sorts, such as *Echinocactus* and its allies, may, about the middle of the month, be put into a hotbed frame for the summer.

Shoots of greenhouse and stove plants requiring to be multiplied will form excellent cuttings at the present time; and it is, altogether, the most eligible period for propagating such plants. A slight heat, a confined atmosphere, with a command over its conditions, and some degree of shade, are the principal things to be provided. Dampness must be always kept under, and its amount daily controlled.



S.Holden del & lith.

Epidendrum phœniceum.

EPIDÉNDRUM PHŒNÍCEUM.

(Purple-flowered Epidendrum.)

Class.
GYNANDRIA.

Order.
MONANDRIA.

Natural Order.
ORCHIDÀCEÆ.

Generic Character.—*Sepals* spreading, nearly equal. *Petals* similar to the sepals, or narrower, rarely broader, spreading or reflexed. *Labellum* with its margins entirely or partially connate with the column; limb entire or divided; disc often fleshy, ribbed or tubercled, occasionally prolonged into a spur. *Column* elongated, with a marginate clinandrum, sometimes fimbriated. *Anthers* fleshy, two to four celled. *Pollen-masses* four.

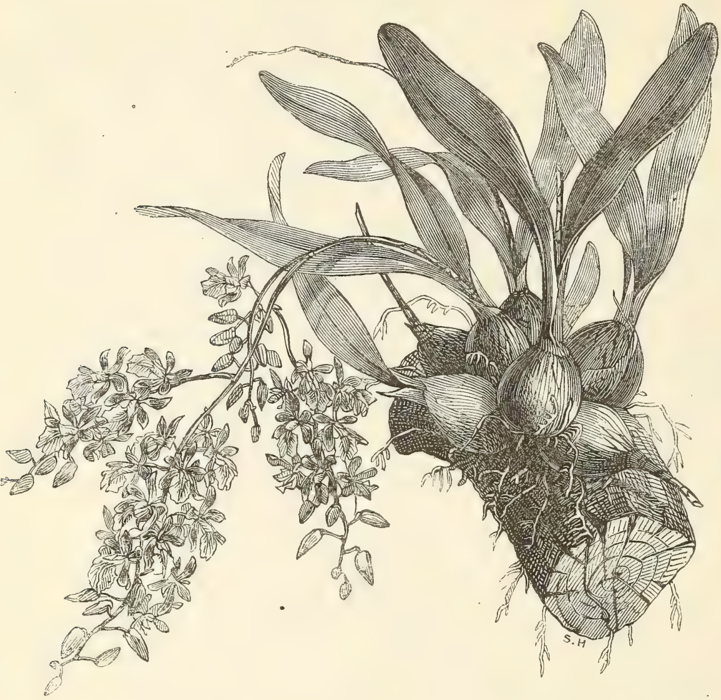
Specific Character.—*Plant* epiphytal. *Pseudo-bulbs* roundish-ovate, two-leaved. *Leaves* oblong-linear, erect. *Scape* panicled, scabrous. *Sepals* and *petals* almost equal, leathery, obovate-lanceolate. *Lip* with its side lobes oblong, erect, obtuse, recurved at the points; middle lobe larger, membranaceous, roundish, undulated, emarginate, with two elevated plates at the base. *Column* obovate, marginate, one-toothed on both sides.

Messrs. Loddiges, who have introduced so many noble epiphytes to this country, and in whose magnificent collection several new ones develop their flowers every month, imported this very handsome *Epidendrum* from Cuba some time in the year 1840, and it bloomed with these gentlemen in the summer of 1841. Our artist then prepared the drawing which is now given, and a sketch for the woodcut below.

"Beautiful as it is," says Dr. Lindley, in the last number of his Sertum Orchidaceum, "it approaches very nearly to the dingy *E. adenocarpon* of La Llave and Lexarza, which is the same as Mr. Bateman's *E. papillosum;* and differs principally in the structure of the lip, which in this species has two distinct elevated plates at its base, ending abruptly, without throwing out any runners into the main surface of the lip; while in *E. adenocarpon* there are no plates, but the whole base of the lip below the column is thick and fleshy, whence diverge five slender radiating veins, the central of which is thickest."

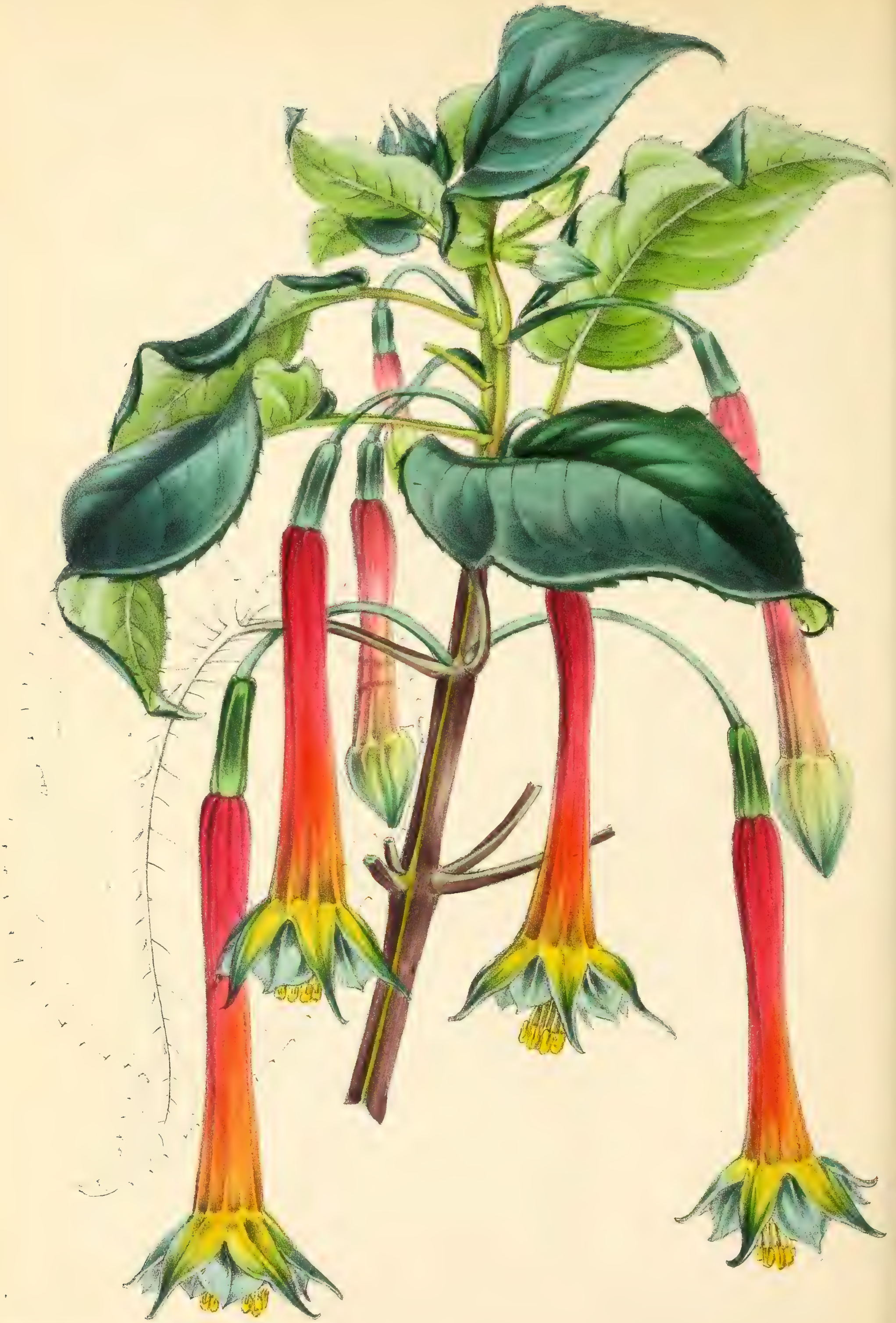
It must not be inferred, from the above extract, that there is any dulness or dinginess in the flowers of our present subject. The colours are perfectly bright, and, though not easily definable, have a very lively and pleasing appearance. Indeed, it is one of the finest Epidendra of which we have yet any distinct knowledge.

As will be seen by the figure, it belongs to the pseudo-bulbous division of the genus. Its pseudo-bulbs are large, nearly round, and have an unusually clear and agreeable aspect. The flower-scape reaches from two to three feet in height, and is proportionably strong; it is covered all over with minute asperities. The flowers, which are scentless, are of a considerable size, and continue opening for two or three months. The sepals and petals are of a light purplish tint, indistinctly mottled with pale green, while the lip is of a delicate pinkish or lilac hue, and has crimson veins. Its appearance, altogether, is very imposing when in flower, every part being more or less ornamental, and, at the same time, in character with the rest.



It is cultivated, like *E. oncidioides* and its allies, in pots filled with heath-mould and potsherds, the lower half of the pot being appropriated to rough drainage materials, and the soil being somewhat raised in the centre, immediately beneath where the plant is placed. A moderately high temperature, with abundance of atmospheric moisture in summer, and both these conditions a little modified during winter, seems to suit it admirably. Propagation is effected by removing one or more of the outer pseudo-bulbs when the plant is in a torpid state.

Epidendrum is derived from *epi*, upon, and *dendron*, a tree, in reference to the epiphytal character of the species. Some species of *Epidendrum* were among the first air-plants made known to botanists; and hence the application of a name which is now understood to indicate the habits of a very large class of the vegetable kingdom.



S. Holden del & Lith

Fuchsia cordifolia

FÙCHSIA CORDIFÒLIA.

(Heart-shaped leaved Fuchsia.)

Class.
OCTANDRIA.

Order.
MONOGYNIA.

Natural Order.
ONAGRACEÆ.

Generic Character.—See p. 27 of the present Volume.

Specific Character. — *Plant* an evergreen shrub, growing four or more feet high. *Leaves* opposite, or in whorls of three, with long petioles, broadly heart-shaped, acuminate, toothed, very slightly downy above, almost smooth beneath. *Pedicels* axillary, one-flowered, shorter than the leaves. *Calyx* pubescent, with a very long tube. *Petals* ovate, particularly short, acuminate.

Among the many fine plants discovered and sent home by Mr. Hartweg, the collector employed by the Horticultural Society, this new Fuchsia will rank with the most hardy and easily cultivated, and therefore the most valuable. When first flowered, owing to its having been kept in too warm a house, and otherwise treated with too much care, its blossoms were comparatively small, and of a pale-orange colour; in consequence of which, it was thought undeserving of much notice. Subsequent culture has, however, from being more appropriate, caused it to expand blossoms as large as those represented in our plate, and even larger; the tints, too, being quite as rich, and sometimes deeper.

It was met with, by Mr. Hartweg, on Ketuch, a volcano in Guatemala, at the height of 10,000 feet above the sea. It will, therefore, be almost capable of enduring the open air in the southern parts of Britain, and has been found to flourish well in the borders during summer. We are not aware that its hardihood has yet been further tested.

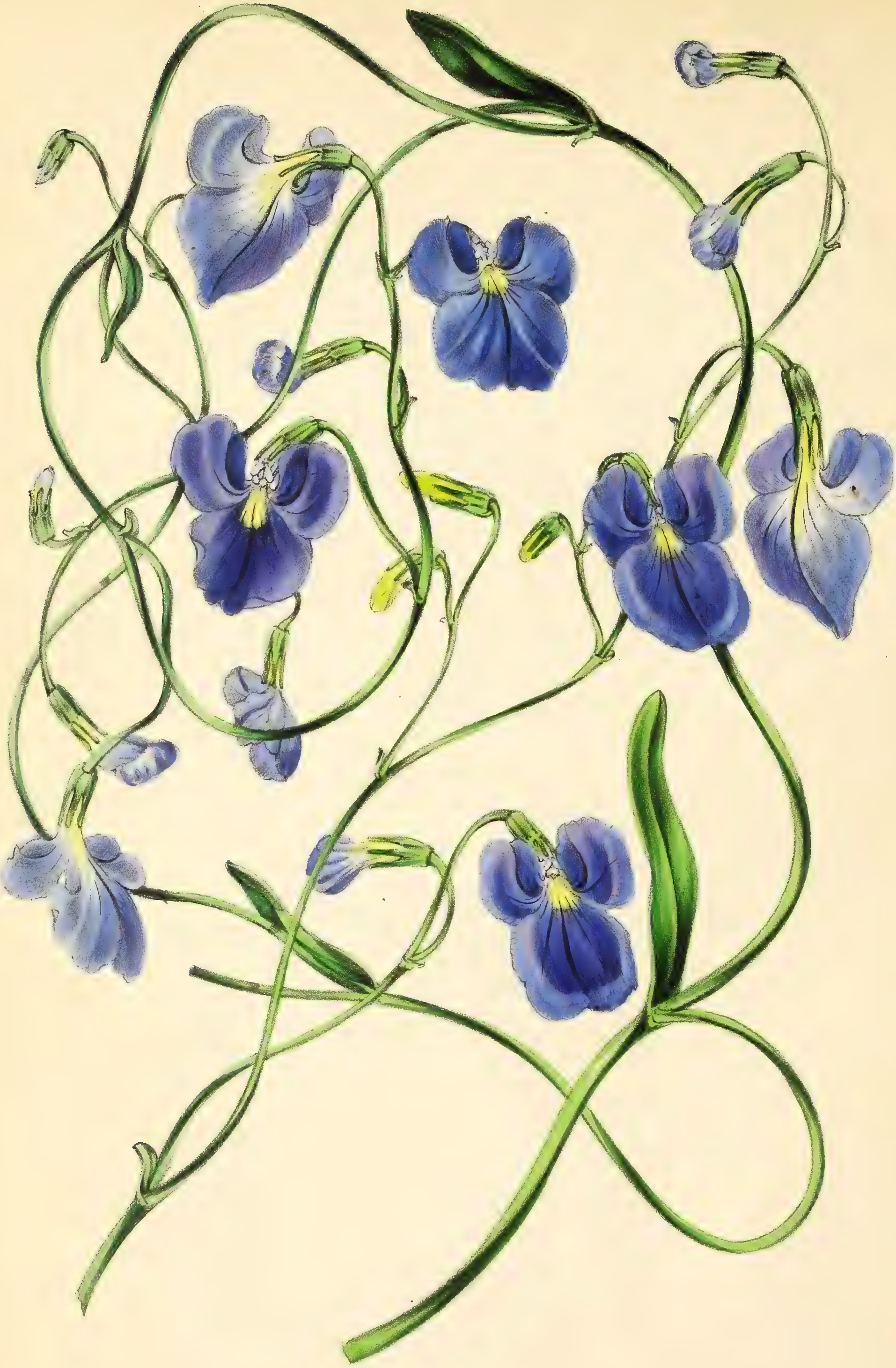
It is a shrubby plant, producing numerous spreading stems, and graceful heart-shaped foliage, which it retains through the winter in a greenhouse. The flowers are solitary, but being generally borne in the axil of each leaf, are by no means scanty or distant. They depend elegantly on long curved peduncles, and are often three inches in length. The bottom of the calyx tube (which, however, is literally *uppermost*, in consequence of the pendent position of the flowers) is of a very rich hue, between crimson and scarlet, and this passes gradually to light orange or yellow towards the summit, where the segments, which are expansive, but not turned backwards at the points, become green. The petals of the corolla are also green;

and though this colour is not, in itself, a desirable one for flowers, yet when contrasted with the tints of the tube, and the deep yellow of the conspicuous stamens, it produces a very good effect.

Cultivated in a greenhouse or conservatory with common soil, the species blooms throughout the greater part of the year, and is especially useful for coming into bloom in March and April, when the ordinary members of the genus are but just beginning to grow. Planted in the open ground, however, about the present time, it acquires by the autumn a luxuriance, and yet a dwarfness and bushiness, which are not seen in the greenhouse, while the profusion and splendour of its blossoms are greatly increased. We should strongly advise that a few plants of it be treated thus, as well for ornamenting the open borders, as for preparing handsome specimens to be removed to the greenhouse in October.

Increase is readily obtained by cuttings, and perhaps by seeds. It may probably prove of some service to the hybridist, in improving the colour of the crimson-flowered kinds. In the Botanical Register, it is stated, that "the berry, in the wild state, is from one to one and a half inches long, and pleasant to the taste. The Guatemalese call it Melocotoncito, and apparently eat it."

Messrs. Young, of the Epsom Nursery, supplied the plant from which our drawing was taken in the autumn of last year.



S.Holden, del. & Lith.

Lobelia heterophylla major.

LOBÈLIA HETEROPHÝLLA; *var.* MÀJOR.

(Various-leaved Lobelia, large-flowered variety.)

Class.
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
LOBELIÀCEÆ.

Generic Character.—*Calyx* five-toothed. *Corolla* tubular, irregular, cleft from the top of the tube into long divisions. *Stamens* having the anthers united and bearded. *Style* simple. *Capsule* two-celled.

Specific Character.—*Plant* annual, smooth. *Stems* angular, nearly simple, irregularly intertwining. *Leaves* thick; inferior ones pinnatifid, toothed; upper ones linear, entire. *Corolla* with the lower lip jagged in the middle, obcordate; lateral lobes unequal, bright blue.

Var. Major.—*Plant* stronger. *Leaves* and *flowers* much larger.

Perhaps no tender annual is more worthy of being generally cultivated, both for the greenhouse and the flower-borders, than *Lobelia heterophylla.* The graceful slenderness and waviness of its branches tend much to add to the charms of its peculiarly brilliant flowers, and to give it a power of arresting interest which few others possess.

Of this very showy little plant we have now to submit a figure of a new and superior variety, which exhibits the characteristics of the species in every material respect but in the greater size of all its parts. Stems, leaves, and flowers, but especially the last, are all considerably larger; and we fancy from the specimens we have witnessed, that the blossoms are borne rather more prodigally.

Mr. Low, of Clapton, imported seeds of this plant from the Swan River Colony in the year 1840. Having been sown in the Clapton Nursery, they germinated, and the plants flowered in great perfection last summer, when the accompanying figure was made.

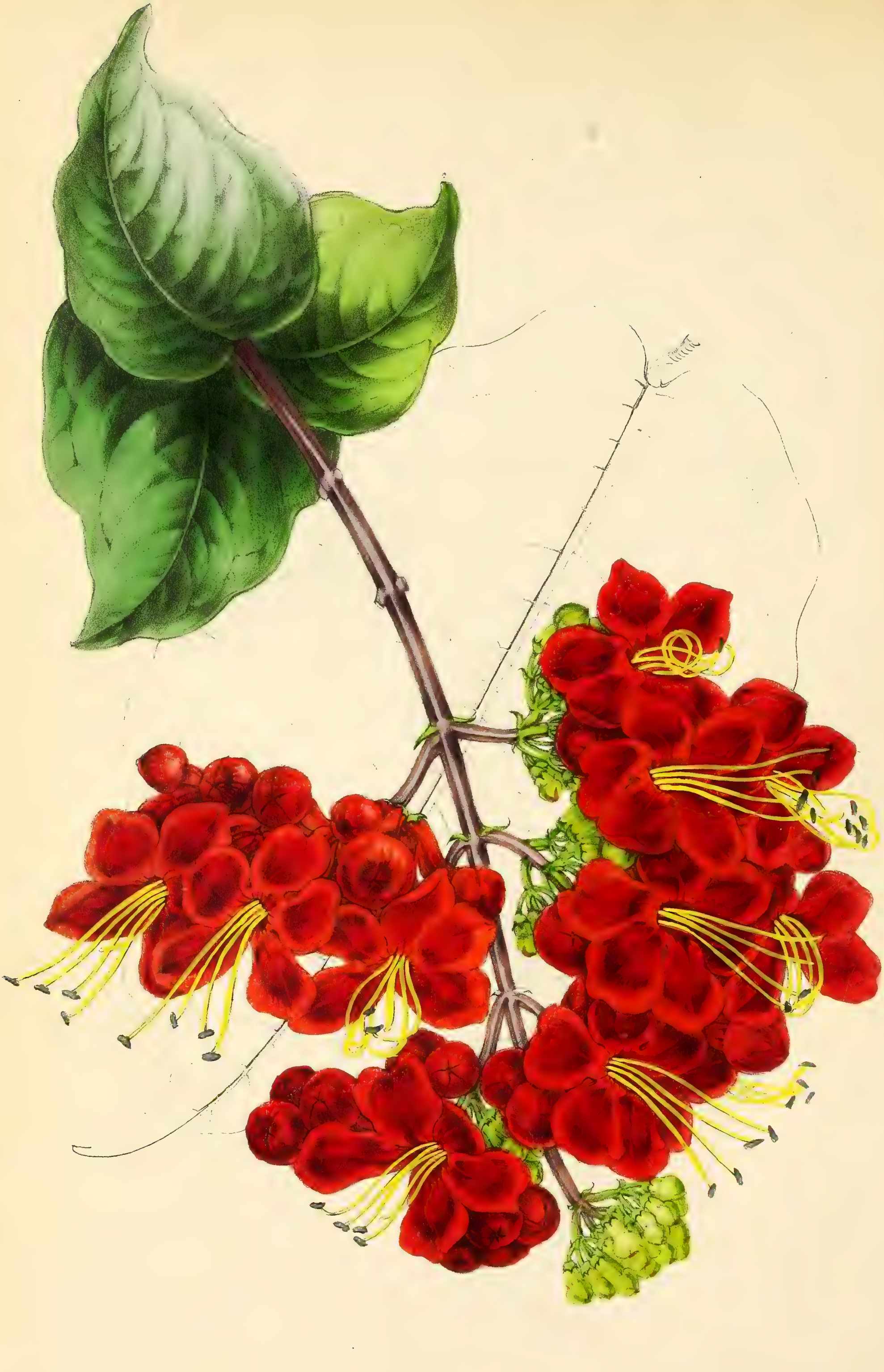
It is impracticable to show in a drawing the very lovely colours of the blossoms, or to give a complete idea of the extreme beauty of the plant. We may, however, say, that during the time it was in bloom (which was between two and three months) we never saw a more lovely group than its blossoms composed.

To cultivate it finely, the seeds should be sown about the month of March in pots of a moderate size, scattering the seeds very thinly. As soon as the plants appear, all but from four to eight, according to the size of the pot, must be taken away, and the rest left to bloom in the seed-pot. A trifling bottom heat will probably be useful in inducing them to vegetate; but when this is accomplished they should be moved by degrees to a very light and airy place in a greenhouse or frame, where they will be prevented from acquiring that weakly character to which they are so liable.

This plant is not well adapted for the open ground, on account of the delicacy and fragility of its stems. A few plants might, however, be turned out from the pots, and if uninjured by rains, they will make a good display.

From its slender nature, it requires some support, and this should be afforded when the plants are about an inch high, by placing three or four short branching sticks in each pot. A few of the twigs taken from the points of a birch-broom will answer the purpose, and they will be sufficient to effect the object without tying the plant to them, if put in at the period above-mentioned.

Linnæus dedicated this genus to Matthew Lobel, the author of various botanical works. He was a native of Lisle, and became physician and botanist to James the First of England. The species *heterophylla* is remarkable for having its lower leaves toothed or divided, and the upper ones entire.



J. Holden del. & lith.

Clerodendrum splendens.

CLERODÉNDRUM SPLÉNDENS.

(Splendid flowered Clerodendrum.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
VERBENÀCEÆ.

GENERIC CHARACTER. — *Calyx* campanulate, five-parted, five-toothed. *Corolla* with a cylindrical tube, often elongated; limb five-parted, lobes equal. *Stamens* four, didynamous, exserted, secund. *Germen* four-celled, one-seeded. *Stigma* bifid, acute.

SPECIFIC CHARACTER. — *Plant* an evergreen climber, smooth. *Leaves* oblong, undulated, acute, subcordate at the base. *Panicles* terminal, corymbose. *Calyx* five-toothed, varying. *Corolla* with oblong nearly equal lobes, and a plain short tube. *Stamens* straight, much longer than the style. *Stigma* two-toothed.

A CLIMBING species in the genus Clerodendrum, though not altogether a novelty, is sufficiently rare to render the acquisition of the present plant an interesting circumstance, had it no other claims to notice. But it is, in reality, rich in desirable qualities, and constitutes one of the best climbing stove plants we possess. It has very handsome evergreen foliage, is of a close and by no means rambling habit, and has splendid flowers, of which it bears an extraordinary abundance, and in large conspicuous clusters.

It was found by Mr. Whitfield, an enterprising naturalist, in the woods of Sierra Leone, and communicated to Mr. Knight, of the King's Road, Chelsea, in one of whose stoves it bloomed last autumn; and there have been either flowers or flower-buds on the same plant ever since. The following account of it, which we take the liberty of transferring to our pages, was sent to Dr. Lindley by Mr. Whitfield, and published in the Botanical Register.

"Late in the month of December, 1838, my servant John Richards brought me a bunch of the flowers of *Clerodendrum splendens*, and afterwards took me to the spot where he found it growing wild, when I took up the root of it after much labour, as the plant was growing in a very stiff gravelly soil. Early in February, 1839, I rambled, when practicable, along the south-west district of Sierra Leone, where I found it growing in greater plenty, and of various colours, viz.—crimson, brick-dusk red, orange, and bicolor (crimson and white); the latter plant seemed to me to be more luxuriant where the soil had been broken up by the liberated Africans, for the purpose of cultivating the manioc; the other varieties had become scarce where the soil had been disturbed; but in every instance, except the first plant, I found it growing in what I consider a strong loam, impregnated (from its colour and aptitude to stain linen) with a large portion of carbonate of iron. The plant Mr. Knight has flowered being scarlet, makes five distinct colours.

" When the root is shaded from the sun by the underwood, this *C. splendens* attains the height of ten or twelve feet. But if exposed to the sun, it seldom grows more than three feet."

Dr. Lindley suggests, that " the varieties here spoken of are probably distinct species, of which several from the same part of Africa are known to botanists."

From the account thus given, as well as from the slight experience that has been had with the plant, it seems to prefer a somewhat shaded position in a stove, and a rich loamy soil. Thus treated at Mr. Knight's, it thrives in great vigour, and blossoms, as before stated, most prodigally. A few young specimens have been obtained from cuttings, and it will be increased more extensively as lateral branches become more freely developed.

We had the annexed very faithful representation made from Mr. Knight's, about three months since.

GARDENING AS A SCIENCE.

No. V.

All the processes of propagation by art (seed-culture being exclusively the method adopted by nature) are dependent upon one general principle, vary it how one may. Propagation by cuttings is the simplest and most ready process,—it is speedily effected; but a great many of our choicest plants cannot be so obtained with either certainty or facility. The next step, therefore, and one which in a degree is similar, is effected by layering. It is more than probable that the discovery of this practice was made by observing the roots produced, occasionally, from branches of some shrubs which take a declining or horizontal position very near the surface of the ground (as for instance, those of the common laurel, even at the distance of an inch or more above the earth). Be this as it may, it has been observed that a shoot bent down or curved, and let into the soil at its curvature, will frequently produce roots, and thus gradually form a plant, independent of its parent.

There are some prejudices concerning layering, however, which it will be right to remove before we allude to the theory. It has, for instance, been asserted, and believed by many, that the elegant and fragrant ornament of the winter garden, now called *Chimonanthus fragrans*, formerly known as *Calycanthus præcox*, can be raised only by layers of the year-old wood, deeply cut through nearly two joints, and left in the ground during two years. Now, we assert, that by the following method, a considerable number of young plants can be obtained by cuttings yearly.

Chimonanthus is quite hardy; but in order to promote the object in view, let one be retained in a pot, the more bushy the better, and preserved through the winter in a dry, sunk, brick pit, open and sloping to the south sun. By the middle of April, a great number of young green shoots will be developed all over the plant, some of them two and three inches long.

Prepare a propagation pot thus:—sift through an iron, fine-meshed sieve, a quantity of the best black heath-mould; put the rough and fibrous part over half an inch of broken crocks at the bottom of the pot, to serve as drainage; these will fill it nearly half way: upon this stratum lay the screened soil, mixed with one-third of silver sand, so deep, when gently shaken and levelled, as to be within an inch and half of the rim. On this heath-soil put about three-quarters of an inch of the pure silver sand, and soak it thoroughly with water Take off any required number of cuttings just above their junction with the old wood; trim with the sharpest knife two or three of the lowest leaves (being careful not to touch the cuticle), cut each across close below the lowest joint, and plant with a slender setting-stick in contact with the side of the pot, so deep as nearly (*i. e.*, within $\frac{1}{20}$th of an inch) to rest on the heath-soil.

Every cutting should be so arranged, as to depth, and fixed firmly in the wet sand: others may be inserted to stock the pot, if there be plenty, but those round the rim are most likely to succeed. A bell-glass must finally be placed over the cuttings, its edge dipping below the surface, to exclude the air; or what is preferable, a double pot, with a bed of sand between both, so as to receive the rim of the glass, might be adopted. The heat of a very gentle hotbed, or propagation-house, and due attention to equable moisture, will prove the fact of our assertion; and, though slowly, plants will be obtained, which may be safely removed to single pots of heath-soil. In this way many plants, that resist the ordinary treatment, might be made to produce roots.

The above is a digression, but not uninstructive, nor irrelevant to the object in view, by which we would prove that if the life of any member of a plant, severed, or partially severed, by a ring or cut, from its parent, can be preserved intact, surrounded by a moist medium suitable to its habits, for a time sufficient to permit the formation of a ring of consolidated, that is, *organized*, *vital membrane*, or *cambium*, at a wounded joint; that member will produce roots, and become a perfect plant. Now, a layer of a woody plant, if it be a free rooter,—as for instance the Vine,—will emit roots without any wound, merely by the obstruction caused by the flexure of a portion of a shoot made to curve into the ground; but in the case of a shrub which is with difficulty induced to emit roots, a cut is made, which ought to pass through a joint, and beyond it, so as to form a tongue, which also ought to be cut across just below the joint, so as to sever the rough piece of wood attached to it. It is evident, that by this slit and cross cut the communication with the parent must be interrupted partially, and that the sap from it can only pass through the uncut side of the shoot. But the case is different with the parts above the wound; these remain entire, if we admit the doctrine of a descending current of laborated sap, or of vital organizable matter, that sap in passing down will be diverted into two channels, one taking its regular course down the sound half of the branch, the other passing to the cut side, and till it arrive at the joint which has been cut through and across. Here, then, the half of the joint acts as a cutting, a callus first forming, which, after a time, emits, or becomes roots that pass into the soil: the layer, therefore, sustains the life of the shoot till the phenomena of rooting are effected. Some plants are so brittle, that it is found difficult to cut the tongue, and bend the wounded shoot, even an inch below the surface: in this case, it would be advisable to ring the shoot, that is, to take off a ring of bark $\frac{1}{16}$th to $\frac{1}{8}$th of an inch broad, just below a joint, then to break out the bottom of a garden pot, pass the shoot cautiously through it, and fill the pot with heath-mould, very sandy loam, or sand and leaf-mould, according to the nature of the plant: thus we have operated very successfully upon Rhododendron of several species; and the plan is suitable to the varieties of moss-rose.

In layering carnations and other herbaceous subjects the knife should enter between two joints, pass through the upper one, and beyond it, taking off the projecting piece of the tongue at the joint or a very little below it, as in preparing a cutting. In general, the earth about the wounded part ought to be light, finely sifted, and sandy; the layer should be covered over at the bend, but not deeply, and retained in its place by a peg or hooked stick applied between the wound and the parent; a moderately moist condition of the earth should also be kept up by occasional gentle watering, if the weather be dry.

Our ignorance of the vitality or vital principle of plants claims the utmost caution, and we are jealous of all attempts to explain *causes;* of effects we are certain. We observe a certain progress; and thus, as in the experiments of cuttings in water, a ring of white matter gradually forms and protrudes between the bark and sapwood of exogenous shrubs and herbs which have fibrous roots; while in others which form bulbs or knobs, no such ring is apparent. The same phenomena precede radification in the wounded joint of a layer, but of what the developing power is we are ignorant; that it is electrical may be suspected, but at present we possess no means of affording positive proof; and therefore all we have to do is to observe, take notes of all that we can trace, compare facts and anomalies, and admire.

Mr. Marcet (Veg. Phys., p. 222) observes: "It is the cambium, which in its retrograde course through the liber, and partly through the alburnum, nourishes the germs (which exist in almost every part of a plant). If therefore you propose to develop them in any particular part of a plant, you must accumulate the cambium in that spot. This may be done in several ways. In the first place you make an annular incision in the bark or rind, and by thus impelling the descent of the cambium, accumulate it in the upper section, where it will produce a swelling or protuberance of the bark. The germs situated in the neighbourhood of this rich deposite of food, if in other respects favourably circumstanced, are brought out; that is to say, if the annular incision be exposed to light and air, the germs of branches will shoot; if below ground those of roots will strike into the soil. Indeed, any casual interference with the descent of the cambium is almost immediately followed by the sprouting of a bud."

These remarks are ingenious, and at all events they evince the author's belief in the existence of germs or systems of life, which lie masked or concealed till called into vital activity by some peculiar stimulus.

ADVANTAGES OF REMOVING DECAYING FLOWERS.

In the application of floricultural art, there are certain operations which are of comparatively modern origin, or to the appreciation of which former cultivators have been very inadequately alive, and which, though seemingly of little moment, would, were their importance rightly understood, be allowed to possess a powerful influence in bringing about a better state of things. And while we observe that ten, twenty, or thirty years back, a general ignorance or neglect of the practices to which we allude prevailed, we are far from exempting the majority of culturists in the present age from the same short-sightedness and inattention. Indeed, it is a consciousness of this which induces us to take up such subjects in a formal manner.

On a late occasion, we entered pretty largely into an enumeration of the benefits that may be realized from frequently stopping the shoots of growing exotics, and we hope another season will not be without its proofs that our remarks have taken effect. The practice to which we now have to direct the notice of our readers is one which has quite as strong recommendations, is as little thought of, and may be applied still more universally.

Anxious to lay a proper basis on scientific principles for every system we advocate, we shall first show how the removal of withering blossoms can affect plants beneficially. Every vegetable being is, it may be assumed, adapted for performing certain general and specific offices, in, by, and for itself. Its roots supply it with nutriment; its leaves increase that supply, and also elaborate it; while both together serve to develop fresh branches, additional foliage, and likewise flowers and fruit. Where the roots are numerous and healthy, and the stems and branches free from disease or impediment, the sustenance derived from the former will always produce effects proportionate to its quality and amount. Hence, there will either be an unusual expansion of shoots and leaves alone, or a moderate production of these, with an extraordinary preparation for future fertility; or, again, the branches and foliage will bear the ordinary proportion to flowers and fruit; or, still further, the last will greatly preponderate, and the former be deficient.

These cases will sufficiently prove that if the quantity of nourishment derived from the earth or elsewhere be expended in one direction, the other channels through which it might flow must be left destitute; in other words, that when there is a superfluity of branches and foliage, inflorescence and fruit will be scanty, and the converse; or, to come nearer to the subject of our remarks, that which is devoted to a particular purpose in one season is necessarily looked for in vain in the ensuing year.

Here, then, we arrive at the point which has the nearest connexion with our present essay; viz., the influence which the products of one year exert on those of the succeeding season. We have yet only noted the balance preserved by the different kinds of developments at the same period. There is, nevertheless, a great similarity in the two instances; for a summer unprolific in flowers and fruits, is commonly followed by one equally fertile in both; so that the harmony referred to is quite as happily maintained.

In the cultivation of fruit trees, it is generally found that a season of abundance brings in its train one of comparative dearth; exhausted Nature requiring some such period of rest to recruit her overtasked functions. It is to be observed, however, that the production and maturation of fruit or seed has an enfeebling effect on plants altogether additional to that caused by the development of flowers; and that there is a wide distinction to be drawn between the culture of a plant for fruit or seed, and one from which flowers alone are desired. If the fruit trees that exhibit an extraordinary crop of blossoms were to be deprived of their flowers shortly after these had faded, they would bloom with equal vigour in the next spring. And thus we elicit the truth on which our remaining deductions are founded.

All plants bearing flowers (excepting only those few exotics that never ripen seed in Britain) are, it must be presumed, prepared to develop and mature the seed of which flowers are the precursors. Their energies are quite capable of elaborating the food necessary for that seed; and, in short, whether the seed be perfected or not, the process of elaboration will go on in the plants. Now, by permitting this force to spend itself in the common and natural way,—*i. e.*, in producing seed,—the specimens are deprived of so much of their vital power, and have within them, consequently, a less provision for subsequent display. On the other hand, by taking away the flowers as soon as they begin to decay, the resources intended for the seed will be retained in the plants, and constitute a fund of supply, beyond the usual one, for the flowers of the following year.

The philosophy, therefore, of the process we recommend is this: Nature, ever acting on a wise and definite plan, when she decorates a plant with its lovely blossoms, gives it, at the same time, the means wherewith to develop and perfect the little embryo within those blossoms. But man, by a timely abstraction of the flowers, husbands and stores the above means, to be brought into action at a future opportunity.

Such being the principles on which the removal of fading flowers operates, it will be supposed, and not without reason, that the results of that practice are very manifest on some classes of exotics. Most persons are aware, though few, save the most zealous amateurs, act up to the conviction, that the blooming of many of the annual plants may be perpetuated till the arrival of frost by this simple means. Sweet Peas may be mentioned as a familiar example. Much more remarkable consequences than this are, however, to be realized. Some plants that die annually, if suffered to seed, will, when the flowers are cut off before the seed-vessel has had time to expand itself, last for two or more years, and even actually become quite shrubby in their habit. *Helichrysum macranthum*, *Lisianthus Russellianus*, and many others, are common illustrations of the first class, to which, indeed, almost every annual might be referred; while the Tree Mignonette will well exemplify the last observation, as it is nothing but the annual kind sedulously relieved of its blossoms. The facility, moreover, with which annuals may be increased by cuttings is another proof of the striking effect of removing flowers; and though, with regard to all annuals, it may be urged that the production of seed is the ultimate and prime object of their existence, which last cannot terminate, unless by accident, till that end is accomplished, and that thus their second crop of flowers, and even their continuance for years, are readily accounted for, the same reasoning will apply to almost every sort of vegetable which has an inherent capacity of reproducing itself by seed, and will, wherever that capacity is checked in its exercise, make its action apparent by throwing out flowers more abundantly, or in more frequent succession.

Biennials, small as is the group they compose, yet afford some evidence of the advantage of the method we are writing upon. The Wallflower and Stock tribes are known to every one; and all may ascertain, by trying the experiment, what can be done for a Wallflower, or a Brompton Stock, or a Snapdragon, by cutting away all its blossoms when their chief beauty has departed. They must not be left till they have ceased flowering; because they will continue developing weakly blossoms almost as long as they have any vitality remaining. But when the lowest seed-pods are nearly of their proper size, and the blooms are perceptibly getting smaller and feebler, the whole should be cut off, and they will soon after emit an immense number of flowering lateral shoots; whereas, were they allowed to seed, they would at once become shabby and perish.

At this stage, we are called to notice that the immediate effect produced by taking away the flowers of annual and biennial plants, is the protrusion of a great number of short and highly floriferous shoots. So that not only is the blooming season prolonged, but rendered, in its second part, yet more showy, besides the improvement that is made in the aspect of the plants by their augmented bushiness. Herbaceous species are acted upon very similarly, and the last-named benefit is far more conspicuous in their case. Shrubs, too, notwithstanding the greater remoteness of the results of this process on them, are affected in an analogous manner, and manifestly develop more shoots as well as flowers in consequence of being so treated.

Taking the next highest order of vegetable life, herbaceous plants show in a yet stronger light the necessity as well as the value of such a proceeding as that we are describing. Whether the sickliness and degeneracy so noticeable in the centre of herbaceous specimens towards the beginning or end of autumn be not rather attributable to the injudicious habit of permitting them to produce seed, than to their tendency to rob the soil of those properties needful to their support, or to their loading the earth with an excrementitious matter deleterious to themselves, may be rationally questioned. At any rate, we are confident that they are much debilitated from the former cause, and hundreds of herbaceous flowers may be made to attest this assertion. But we here speak merely of such as flower only once in the season.

To advert to the class of herbaceous plants whose flowers can be developed at least twice in the year, or the greater part of the summer, by the means now treated of, there is the tribe of Rockets, one or two species of *Anchusa* and related genera, several kinds of *Campanula*, with Verbenas, Calceolarias, and numberless hardy and half-hardy plants besides. To pluck the decaying blossoms from these is simply to ensure that they emit a tenfold greater quantity of branches, and flower in proportionately greater profusion; and this within a very short time after the performance of the operation.

There are many plants whose habits are what are called sub-shrubbby, which fall most appropriately within the range of common observation, and under the influence of the treatment we propound. Pentstemons will serve as the type of that division which does not bloom again directly; and it may be remarked of them, as of some biennials, that the flower-stems ought to be taken off ere the upper blossoms open, because, by that time, the lowermost seed-pods are attaining their full size, and draw too much nourishment from the plant, as well for its health, as for the due expansion of the later flowers. Border Pelargoniums, and some sorts of Alyssum, Draba, &c., are amongst those which speedily flower a second time, or remain blooming for a considerable period; and their display is greatly heightened, and rendered more durable, by attention to the subject of our paper.

Finally, there is a vast variety of shrubs whose flowering propensities are elicited or multiplied, if they are only prevented from forming seed. They who say of Rhododendrons, Azaleas, Heaths, or any greenhouse or stove exotic, that its seeds and seed-vessels are so small, their production cannot injure it, speak without the requisite reflection. Let a seed be as minute as it may, it is that which Nature has fitted it for bearing, and in the producing of which it has to exert itself quite as much, compared with its powers, as another plant that yields a large and pulpy fruit. In this sense, then, all fruit or seed-bearing is alike exhausting, without any regard to the size of the object borne.

We hope we have already placed in a clear point of view the high advantages of which all cultivated plants are susceptible from having their dying flowers removed. The system admits of a further argument in its favour from the neatness and tidiness it entails. Nothing is a better test of a well-kept garden than the way in which the falling-flowers are disposed of. If they are left to wither away of themselves, while their stems become laden with seed-pods, it is a mark of slovenliness and inattention, which merits severe reprobation, whether it occur in the plant-houses or the open borders; and no place will ever have a finished or elegant aspect under such management. If, however, they are plucked directly their beauty has fled, and the old stems, with their supports, carefully removed, we should infer that a tasteful as well as industrious person had the direction of affairs, and an air of peculiar good keeping and polish would be the constant result.

Should it be objected to the general adoption of such a plan, that it occasions extra trouble, we must revert to what should be the standing objects of every cultivator; and we believe all would acknowledge themselves actuated by a desire to induce a high state of health in their charge, and simultaneously to render them at all times as beautiful as possible. Satisfactorily to attain such ends, a little labour must undoubtedly be sacrificed; and if it could be distinctly perceived how trifling an amount would be consumed in the process herein suggested, comparing the results of its neglect with the issues of its judicious adoption, we should have no fear either that our hints would be slighted, or that we shall be accused of having given too much space to the consideration of the topic.

On the effectuation of this method nothing needs to be advanced. All the direction necessary is to see that the flowers are plucked as soon as practicable after they have faded; or should they be in spikes, the diminution in size, and feebleness in appearance, of the upper blossoms, with the rapid advances to perfection of the lower seed-pods, may be taken as the signal for destroying them.

As it is always best in establishing a rule to state the exceptions to which it is liable, that it may not be afterwards encumbered with needless difficulties, we shall just name three conditions in which the practice we have been supporting would be improper. The first and most obvious one is where seed is wished for. The earliest flowers, if they be not too early, invariably yield the finest seed, and should therefore be left for that purpose. Even here, nevertheless, the plan is worthy of being followed, after an adequate number of seed-pods are formed; since the removal of the remaining blossoms will not only throw more nourishment into the seeds, but save the plants, supposing them to be perennials, from undue exhaustion. The next condition relates to those plants whose seeds or berries are ornamental. Many species of *Berberis*, *Enonymus*, *Billardiera*, *Fuchsia*, &c., are included in this section; yet, whatever may be the beauty of their fruit, its production should be moderated according to their strength. Lastly, some exotics, especially climbers, evince so strong a disposition to bear wood and leaves rather than flowers, that when they do blossom it is often advisable to let them mature a little seed, in order, by withdrawing their superfluous sap, to confirm and enlarge their flowering tendencies.

TENDER CLIMBERS FOR SUMMER PURPOSES.

Horticulture, as practised in the present day, is essentially different from the gardening of former times; and one of the leading features of the change it has undergone in the floral department, is, as we have previously pointed out, the partial naturalization of tender exotics. This attempt at acclimatation does not extend beyond summer exposure; but during that long and important period throughout which no frosts are experienced, how great is the change which the introduction of greenhouse perennials and shrubs effects in the aspect of our pleasure gardens!

Of all the tribes of what are termed half-hardy plants, there are none so interesting, when properly treated, as climbing species, because no others have such a truly exotic appearance. Being by no means numerous, for the most part well known, and of a delicate, succulent, or tender-looking habit, the mind is at once filled with pleasure in contemplating their graceful forms under an open sky, and experiences, beyond the gratification caused by their intrinsic beauty, all the delight that flows from having reared a susceptible and fragile being amidst unpropitious circumstances.

Having in various parts of our Magazine made detached observations on several species belonging to this class, we shall concentrate and extend them, and shortly depict the different methods of treating these plants, afterwards giving a list of the most ornamental.

Tender climbers are valuable for covering a wall quickly and temporarily through the summer months. It often happens, from a variety of causes, that a wall or part of a wall is laid bare in a more or less conspicuous portion of the pleasure grounds; and as no permanent objects could clothe it so speedily, species are employed which soon extend themselves over it, and make what would otherwise be a disagreeable and unsightly mass, a most delightful and attractive surface. In other instances, a wall, perhaps distant from the mansion, and rarely seen in the winter, is mantled every summer with climbers of this description, in preference to more stationary plants, because the former are much more showy. The case, again, of conservative walls, or those appropriated to either hardy or greenhouse climbers, or both, usually demands for the first few years the aid of some temporary ornaments, to fill up the vacancies left by the more slow-growing specimens that are ultimately to occupy them; and here the usefulness of the plants under discussion is further apparent.

In many gardens, too, there are wall-like trellises traversing particular compartments,—whether composed of wood or strong wire is of no moment,—and sometimes intended to act as lines of separation from other spots, though often put up solely with the view of supplying a place for ornamental climbers. To these trellises hardy and shrubby species may or may not be attached, in accordance with their design; but when they are made use of, the introduction among them of a few tender herbaceous species will very much enliven their aspect, and if hardy kinds are not employed, of course the whole will be devoted to the subjects of our article.

A sort of trellis has lately come into use in flower-gardens of an irregular character, or small ones that have been laid out with the express intention of adding such a thing, which is made to overarch one or more of the principal walks. It is usually constructed of thick iron wire, and rendered very durable, that all kinds of climbers may be supported by it. Where, however, only the summer species which we are now referring to are desired to be grown, thin and rustic wooden rods will be quite as serviceable, and may be taken away in the autumn.

Trellises in the shape of baskets afford facilities for training a few climbers of the character herein indicated, and care should be exercised in selecting those, the colours of whose flowers will harmonize well with the prevailing tints in the beds beneath.

Wire-trellises, again, in the form of parasols, balloons, simple barrels, a tuft of plumes, or any figure which may best suit the taste of the culturist, can be placed sparingly on lawns, among the shrubs or beds with which they are diversified; and if covered with appropriate summer climbers, they will produce a very grateful variety in such a scene.

Nets of string or wire, or trellises of slender wood, can be spread over one or two of the beds of a flower-garden, and the former kept sufficiently above the earth by forked sticks stuck in the ground at short distances from each other. Dwarf climbers may then be planted in the beds, and allowed to trail over the trellis, or be aided in doing so by an occasional attachment.

Poles, again, constitute a ready and elegant means of supporting tender climbers, whether they stand on lawns, at the backs of borders, or in the midst of flower-beds. They may be simple, or in groups of three or four, and connected by cross bars or pieces of string. And where a slight hedge or line of demarcation is needed during summer alone, a row of poles, similar to those used in the kitchen-garden for scarlet-runner beans, will answer the end as well, probably, as a regular trellis.

An improvement on straight and unbranched poles consists, however, in stakes like those just alluded to, but having all their branches left upon them, or merely the longest of them shortened a little. One of these, placed by the side of a climbing plant, with trifling subsequent attention to see that the main shoot or the branches do not lose their hold of it too soon, will lead to the production of a specimen as graceful and interesting as can readily be conceived of.

Numerous as are the devices we have described for sustaining climbers, we might notice many more did our space permit. At present, we shall confine ourselves to the mention of one other, which must not be despised for its rudeness and simplicity, since it is an exceedingly good way of treating species that have many stems, or that branch freely. It is to place three or four rough and branching stakes in the ground around the specimen, and let the latter cling to them and cover them in the manner most natural to it. The sticks should not be more than three feet high, and unless the plant be disposed to ramble considerably, it must be assisted in the arrangement of its branches, or induced to develop lateral shoots by having its leading ones stopped.

Our promised list shall now be furnished. We insert it alphabetically, to make reference easier; and omit all descriptive particulars, as they can be obtained without difficulty in any catalogue.

Campanula pyramidalis
Cobæa macrostemma
  — scandens
  — stipulacea
Convolvulus speciosus
Eccremocarpus scaber
Lathyrus Armitageanus
  — sylvestris (hardy)
  — tingitanus (hardy)
Loasa lateritia
  — Herbertii
Lophospermum erubescens
  — spectabile
  — scandens
Manettia cordifolia

Maurandya Barclayana
  — pulchella
Pentstemon argutus
Philibertia gracilis
Rhodochiton volubile
Thunbergia alata
  — — alba
  — aurantiaca
  — other varieties of alata
Tropæolum majus atrosanguineum
  — Moritzianum
  — pentaphyllum
  — peregrinum
  — tuberosum
Tweedia cærulea

Two plants appear in the above list which, though they cannot be called climbers, make an excellent display when fastened to a trellis or a wall. These are *Pentstemon argutus* and *Campanula pyramidalis.* We have not noticed several that commonly appear in such enumerations, because they are either unworthy of culture, or are not now to be procured.

In applying to any of the foregoing plants either of the methods of training or support we have mentioned, regard must, of course, be had to their peculiar habits. Thus, for clothing a wall or flat trellis rapidly, none are so suitable as the Cobæas and Lophospermums. For a similar purpose, or for surrounding a pillar, the *Eccremocarpus*, *Loasa*, and *Maurandya* are excellent. For covering an arched trellis, the same species, as well as the Tropæolums and *Rhodochiton*, may be fitly employed. Basket-shaped trellises, again, can be best furnished with *Convolvulus*, *Maurandya*, *Thunbergia*, or *Philibertia.* The low trellises above flower-beds are most adapted for *Maurandya*, *Lophospermum scandens*, or Thunbergias. Poles and branching stakes are suited for *Lophospermum erubescens*, *Loasa*, and *Tweedia cœrulea.* Dwarf stakes are most proper for *Tropæolum tuberosum* and *Moritzianum*, *Maurandya*, *Thunbergia*, *Manettia*, and the Everlasting Pea. What we have thus said may give a faint clew to the cultivator, and those who are familiar with the character of the plants can vary their treatment at discretion.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR MAY.

Alstrœme'ria psittaci'na *var.* Erembouldtii. "I understood from the first," writes the Hon. and Very Rev. W. Herbert, "that *A. Erembouldtii* was raised in Germany between *A. psittacina* and *pulchra*, or *Hookeriana*, and I see no reason to doubt the fact. Alstrœmerias, impregnated by the pollen of another species, are very apt to produce strong pods, which disappoint the cultivator by proving empty; but, occasionally, they contain one or two seeds. *A. Erembouldtii* is not a free plant. A strong tuber planted out amongst other Alstrœmerias at Spofforth did not vegetate." It requires to be grown in a pot, and treated with care, when it flowers well in the month of July. The flowers are of a whitish ground, shaded with pink, and having a yellow stain down the centre of each petal. They are richly spotted with brownish purple, and very handsome. *Bot. Mag.* 3944.

Aza'lea altaclare'nsis. This fine variety originated at Highclere, the gardens of the Earl of Caernarvon, and "was produced by fertilizing the flowers of *A. sinensis* with the pollen of the late-flowering variety of *A. viscosa*, called by the nurserymen *A. rubescens major.* It bears the most decided evidence of its double parentage, having the glaucous foliage and inflorescence of *A. sinensis*, modified by the pale-crimson tints of *A. rubescens major.* It is most profuse of its odorous flowers, which cover the whole bush, and is altogether a very striking production." *Bot. Reg.* 27.

Catase'tum globiflo'rum. "Dr. Gogarty, now a resident medical practitioner at Rio, sent this beautiful plant to the Glasnevin Botanic Garden," Dublin, in 1840, and it flowered in the stove of that establishment, producing from one specimen no less than fifteen of its singular flowers. The pseudo-bulbs are not remarkable. The flower-spike is particularly long, and bears a great number of blossoms. "The entire blossom represents very nearly a depressed globe; the sepals ovate, acute, very concave, imbricated, mottled with purplish dingy brown. The two petals are similar in size and shape to these, but concealed by their closer lapping; and they are pale green, spotted with purple brown." The lip is peculiarly concave, contracted towards the mouth, "pale green, richly spotted with deep purple towards the margin, and dotted with red near the apex." *Bot. Mag.* 3942.

ECHEVE'RIA ACUTIFO'LIA. Allied to *E. gibbiflora*, from which it is distinguished by the following marks. "The leaves of *E. acutifolia* are acute, in *E. gibbiflora* they are obtuse; in the former, too, they are much more green and richly touched with scarlet than in the latter. In *E. acutifolia* the flowers are disposed in a short, narrow, erect, cylindrical panicle, and they are of rich scarlet, tinged with yellow; in *E. gibbiflora* they grow in a loose rambling panicle, and are much less brilliantly coloured. Finally, the lateral branches of *E. acutifolia* are short, straight, and only bear three or four flowers in a corymbose manner at the end; while in *E. gibbiflora* they grow all along one side of long, drooping, zig-zag, many-flowered shoots." The species is a native of Oaxaca, in Mexico, where it was discovered by Mr. Hartweg, and from whence it was sent to the Horticultural Society. *Bot. Reg.* 29.

EPIDE'NDRUM CINNABARI'NUM. A very showy epiphyte, with tall slender stems, and flowers slightly similar to those of *E. Schomburgkii*, but differing in the colour, which has a greater dash of crimson, and in the labellum. The present species has the lateral lobes of the lip "deeply lacerated, while the central lobe is contracted in the middle, and then *suddenly* wedge-shaped, with its angles prolonged into one or two fine teeth; *E. Schomburgkii* has the lateral lobes only toothed, with the centre lobe gradually widened to the point, and three toothletted, without being at all truncate; in the latter, indeed, the lobes of the lip are sometimes confluent." The stems and leaves of *E. cinnabarinum* are also without the spottings peculiar to *E. Schomburgkii.* It was obtained from Pernambuco, by Messrs. Loddiges, and flowers in May. *Bot. Reg.* 25.

GLOXI'NIA SPECIO'SA *var.* MENZIE'SII. A very handsome garden variety, common in nurseries, and having the "tube of the corolla white or cream-coloured, with a tinge of purple:—the limb much paler than the usual state of the plant; while, withinside, the almost white throat is elegantly marked with copious purple dots." It was figured from Messrs. Chandler's, of Vauxhall. *Bot. Mag.* 3943.

JASMI'NUM CAUDA'TUM. Introduced to the Botanic Garden, Calcutta, and from thence to England, from the warm valleys of the Sylhet Mountains, in India. "It is a graceful, healthy-looking plant, with deep-green, handsome leaves, which are tapered into very long narrow points, whence the name it bears has been given to it. Although the flowers have none of the perfume of the Jasmine, the masses of them, snow-white and large, render it a handsome species well worth having. It requires the temperature of a cool stove, where it grows and flowers in great luxuriance. It is well adapted either for planting out in the border of the stove and training up the rafters, or for twining round stakes in a pot." *Bot. Reg.* 26.

LANTA'NA SELLOVIA'NA *var.* ACUTIFO'LIA. A pretty, but not strongly marked variety, chiefly distinguishable from the species by "the larger and longer foliage, and narrower leaflets of the involucre. In other respects they quite accord." It was raised from seeds that had been sent from Monte Video, by Mr. Tweedie, to the Glasgow Botanic Garden, several years back, and flowers most abundantly in the greenhouse. *Bot. Mag.* 3941.

MAXILLA'RIA CUCULLA'TA. Introduced by Mr. Henchman from tropical America, and first flowered with his Grace the Duke of Devonshire. It is a dwarf species, with tufted pseudo-bulbs, and solitary flowers, which are borne on a scape of about four inches long that springs from the bottom of the bulb. The blossoms are of a greenish-chocolate colour, and have a darker lip. The specific name applies to the "hooded appearance of the upper sheath or bractea, just beneath the flower." *Bot. Mag.* 3945.

ONCI'DIUM SPHACELA'TUM. Neat and interesting, but having flowers of the usual yellow and brown colours. "In habit, it resembles *O. reflexum*, *Pelicanum*, and *Baueri*; but is immediately known from them by the wings of the column, which are long, notched, and bordered with brown as if scorched. There are two varieties in cultivation, one much handsomer than the other, with arger flowers." It was sent from "Guatemala, to his friends, by Mr. Skinner ; by Mr. Hartweg, rom the same country and Mexico, to the Horticultural Society ; and from Honduras to Messrs. Loddiges, with whom the species first flowered in February 1841." *Bot. Reg.* 30.

Ornitho′galum divaricaˋtum. By no means a striking plant. "Mr. Hindes, the surgeon of the Sulphur, surveying ship, met with it on the coast of California, and sent it to the Horticultural Society, in whose garden it flowered last June. It has large oblong bulbs, covered with coarse brown scales ; the leaves are very long, wavy, channelled, of a dull green colour, and being too weak to support their own weight, they lie prostrate. The flowering stem is erect, about two feet high, panicled from the base, with straggling branches bearing slender racemes of distant flowers. The latter are white, with a green stripe along the back of each division. It is a hardy bulbous plant, requiring the same treatment as Veratrums or Helonias, and growing freely in any sandy soil. It flowers from July to August." *Bot. Reg.* 28.

NEW OR INTERESTING PLANTS LATELY IN FLOWER AT THE PRINCIPAL SUBURBAN NURSERIES AND GARDENS.

Campa′nula gra′ndis. A plant of this name is now flowering in a greenhouse at Messrs. Rollisson's, Tooting, and is said to be nearly or quite hardy. It approaches nearest to *C. pyramidalis,* producing its flowers in a tall erect spike. The leaves are, however, longer and narrower, and the flowers are larger, as well as of a richer blue colour. It promises to be a particularly fine species.

Chorozeˋma va′rium na′na. Of the several varieties of this pretty plant, the best is a peculiarly dwarf kind, found in most nurseries under the above appellation. It is a very low-growing sort, extremely bushy, and having large dark-coloured blossoms, which it produces in great abundance. Few greenhouse exotics are superior to it.

Fuˋchsia Monype′nnii. We have just seen at Messrs. Henderson's, Pine-apple Place, a specimen of this new hybrid. It is a luxuriant grower, with handsome leaves, and very long spreading flowers, which are of a most brilliant red colour. It is certainly one of the finest of its class.

Gompholoˋbium Hendersoˋnii. This very interesting species is a dwarf shrub, of a singularly compact habitude, with numberless short lateral shoots, from the tops of all which the beautiful flowers issue singly or in clusters. They are bright yellowish red, sometimes changing to a duller and paler hue. It remains in bloom many weeks, and is at present flowering with Messrs. Henderson, of Pine-apple Place.

Ipomœˋa rubro-cæruˋlea *var.* A pleasing variety of *I. rubro-cærulea* is blooming in a stove at Messrs. Henderson's, and is noticeable for producing its flowers while in a small state. The blossoms are also destitute of any tinge of red, and are of that deep and beautiful pure blue which the sky sometimes assumes at midsummer. By plucking off some of the leaves, the development of flowers seems to be facilitated.

Læˋlia fla′va. Yellow flowers certainly constitute a novelty among Lælias, and the present species is, besides, particularly elegant. The pseudo-bulbs and leaves approximate to those of *L. cinnabarina,* and the flowers are elevated on a slender waving stalk, rather more than a foot long. They are numerous, and of a brilliant and rich yellow tint, with an inclination to light orange. We saw it blooming, a short time since, in the choice collection of S. Rucker, Esq., of Wandsworth, Surrey.

Lalaˋge hoveæfoˋlia. Differing from *L. ornata* in the greater weakness of its branches, its less erect habit, and its opposite downy foliage. It germinated in the Clapton Nursery from seeds derived from the Swan River Colony, and has recently flowered in one of Mr. Low's greenhouses. The flowers, like those of *L. ornata,* are yellow, which gradually changes to brown in the centre. It is a good species, and, as we think, excels *L. ornata* in some particulars.

Mi′lla —— ? A plant which undoubtedly belongs to this genus has bloomed all the winter in an open pit at Mr. Low's, Clapton. It has slender, half-drooping, channelled leaves, and bears its flowers solitarily, on partially erect peduncles, two or three inches in height. The blossoms are cream-coloured, and several more decided bands of blue radiate from the middle. It was still flowering in a cold house last month.

MIMU'LUS SEYMOURIA'NA. There are few hybrids, in the way of *M. Smithii*, which are distinct enough to merit notice ; but the one bearing the title here given, although having flowers with the usual dark blotches round a yellow centre, is rendered very attractive by these blotches or bands —themselves of a dark and bright brown—being again stained or clouded with a still deeper and velvety-looking colour. The blossoms, too, are very large, and the habit is good. We met with it at Messrs. Henderson's, of Pine-apple Place.

MIRBEL'IA GRANDIFLO'RA. This excellent greenhouse shrub has been producing its flowers for the past two months with Messrs. Henderson, Pine-apple Place. It forms a low dense bush, with very regular, ovate, and reticulated foliage, and flowers of a clear yellow colour, with a dash of brown at the base of the standard and in the keel. It ranks amongst the most ornamental of its race.

MORMO'DES LINEA'TA. Without having a single leaf, this curious orchidaceous plant lately developed its blossoms at Messrs. Loddiges' and Messrs. Rollisson's. The strong upright flower-spikes issue from the sides of the pseudo-bulbous stems, and bear eight or more remarkable-looking flowers. These have their sepals and petals yellowish, spotted and mottled with brown, while the lip is white, curving upward at its extremity, and showing two little pendent lappet-like appendages on the lower part beneath. It grows well in a suspended basket, or on a log of wood, and the roots are not injured by being left uncovered.

PÆO'NIA TENUIFO'LIA PLENA. The gorgeous dark red double flowers of this variety contrast so strongly with the finely-divided and elegant leaves, that it makes a remarkable feature in the flower-borders. Its dwarfness, likewise,—for it does not grow more than a foot in height,—and the little room it occupies, are further recommendations. It is blossoming splendidly in the open ground at Messrs. Young's, Epsom.

PHYSOLO'BIUM CARINA'TUM. The graceful climbing habit of this interesting plant is well supported by the peculiarly showy colours of its flowers, which are not equalled by those of any other papilionaceous plant. They are of a deep sanguineous purple, with a yellow blotch at the base of the upper portion. It is flowering well at Messrs. Henderson's, and other places, in the greenhouse.

PHYSOLO'BIUM GRA'CILE. Altogether more slender than the foregoing, and with rather smaller and paler leaves and flowers ; but scarcely less attractive. Both continue in bloom for three or four months, and bear seed freely.

PODOLO'BIUM BERBERIFO'LIUM. Very closely related to *P. staurophyllum*, from which it is hardly to be distinguished. It is, however, an ornamental plant, and bears a great number of specious yellow blossoms. Specimens are blooming profusely in a greenhouse at Mr. Knight's, Chelsea.

RIBES, *hybrid*. Mr. Beaton, gardener to Sir William Middleton, Bart., of Shrubland Park, raised, some years ago, a hybrid Ribes, between *R. sanguineum* and *R. aureum*. This has flowered in the present spring with Mr. Low, of Clapton, and proves to be a handsome plant, bearing very long racemes of flowers, in which the red and yellow colours are happily blended. It will be quite an acquisition to the shrubbery.

STA'TICE PSEU'DO-ARME'RIA. Resembling the common Thrift in the form and arrangement of its flowers, which are, however, very much larger and handsomer, though of a paler pink hue, than some of the varieties of that plant. The leaves, too, are very different, being much broader and less grass-like. Messrs. Young, of Epsom, have it in a flowering state.

TROPÆ'OLUM POLYPHY'LLUM. Imported, we believe, from Valparaiso, and now flowering in a greenhouse with Mr. Low, of Clapton, and other cultivators. Its leaves are divided into numerous narrow segments, and the flowers, which are of a light orange hue, have a form similar to those of *T. tuberosum*. It seems disposed to blossom liberally, and will most probably prove an ornamental plant.

VA'NDA CRISTA'TA. Messrs. Rollisson, of Tooting, have had this curious and handsome plant in flower in their Orchidaceous-house for the last four or five months. It has rather narrow, close, and deeply-channelled leaves, and the flowers stand out singly on long peduncles. They are large, whitish, and have their lip mottled and striped with dark brown. It grows finely on a block of wood, suspended from the roof of the house.

VA'NDA VIOLA'CEA. A most lovely species, lately flowered by Messrs. Loddiges. It is of a vigorous habitude, and the flowers are borne numerously on strong racemes. The sepals and petals are white, slightly tinted with violet, and the lip is richly striped with a violaceous purple. It is among the finest of the group.

VI'OLA ARBO'REA. The term "Tree Violet" has been applied to an interesting kind, which has fine deep blue, double, and fragrant flowers, and may, by treating it similarly to the Mignonette, when it is wanted to form a shrub, be made into a beautiful dwarf woody plant, with a stem a foot or more in height, and the leaves and flowers drooping gracefully from the summit. To bring it to this state, it is only necessary to remove the flowers and side shoots for the first year or two, and then to let it take its own course. We have not, for a long time, met with a more pleasing and delightful object.

ZI'CHYA MO'LLY. The handsomest of all the Zichyas in regard to the size of its flowers, and readily known from *Z. coccinea* or *tricolor* by the much greater size of its foliage and blossoms, and the smoothness and comparative softness of the former. Its flowers are, however, rather paler than those of the species just referred to, and more like the blooms of *Kennedya Stirlingii.* It is blossoming in good condition at the gardens of the Horticultural Society, Chiswick, where it is trained to a low trellis, and kept in a pot in the large conservatory.

ZI'CHYA VILLO'SA. Principally separated from *Z. coccinea* by the downiness of its leaves. In other respects, it constitutes an equally beautiful climber, and its flowers are of the usual red and yellowish hue. Messrs. Henderson, of Pine-apple Place, have flowered it in their greenhouse, having obtained it from Australia.

OPERATIONS FOR JUNE.

THE beauty of the flower-borders at this season will have, in some measure, diminished the necessity for rendering the plant-houses as gay as they should be during the months of March and April, and the flowering period of many in-door exotics will also now be past. Yet the houses can still be made very attractive by the introduction of flowering annuals, Pelargoniums, Calceolarias, Gloxinias, Treviranias, &c.; and in the absence of flowers from the common stock, more attention should be bestowed on the growth of their new shoots, and their general health.

Some remarks will be found in a previous page on the beneficial effects of removing withered blossoms, ere the seed gets time to develop itself; and these are peculiarly applicable to plants in pots, which are necessarily more injured by extra exhaustion in consequence of their roots being so confined. A vigilant superintendence should therefore be exercised in this particular; and likewise in regard to the shortening of young and weakly shoots, treated of in a former Number. The directions concerning the latter do not, however, refer so much to the annual and proper growth which plants make at this time, but rather to the adventitious developments of prior and subsequent periods. Still, where new shoots are too long, or too feeble, or not taking the right direction, it is better to reduce them now than let them expend their strength to no purpose.

Watering, during this and the following months, is a work requiring to be very constantly performed. While we speak thus, we do not mean that each specimen should be watered regularly, at certain stated hours, but that the cultivator must be always on the watch to apply it where necessary. Some kinds of shrubs, such as Rhododendrons, Camellias, and Hydrangeas, require to be almost deluged with water at the present time; and, provided the pots or soil in which they grow be properly drained, can hardly have too much. For others, as Heaths, more caution is requisite. The best general criterion, apart from the actual examination of each specimen,—which, after all, is the only safe and correct mode of proceeding,—is the amount of surface which the leaves of a growing plant presents to the atmosphere. Large and broad-leaved species demand large supplies of moisture, on account of their great evaporating surface; while species with small and narrow foliage need much less water, for the converse reason. The latter, nevertheless, by imperfectly shading their roots, often require more fluid than, from a glance at their leaves, they would appear to do.

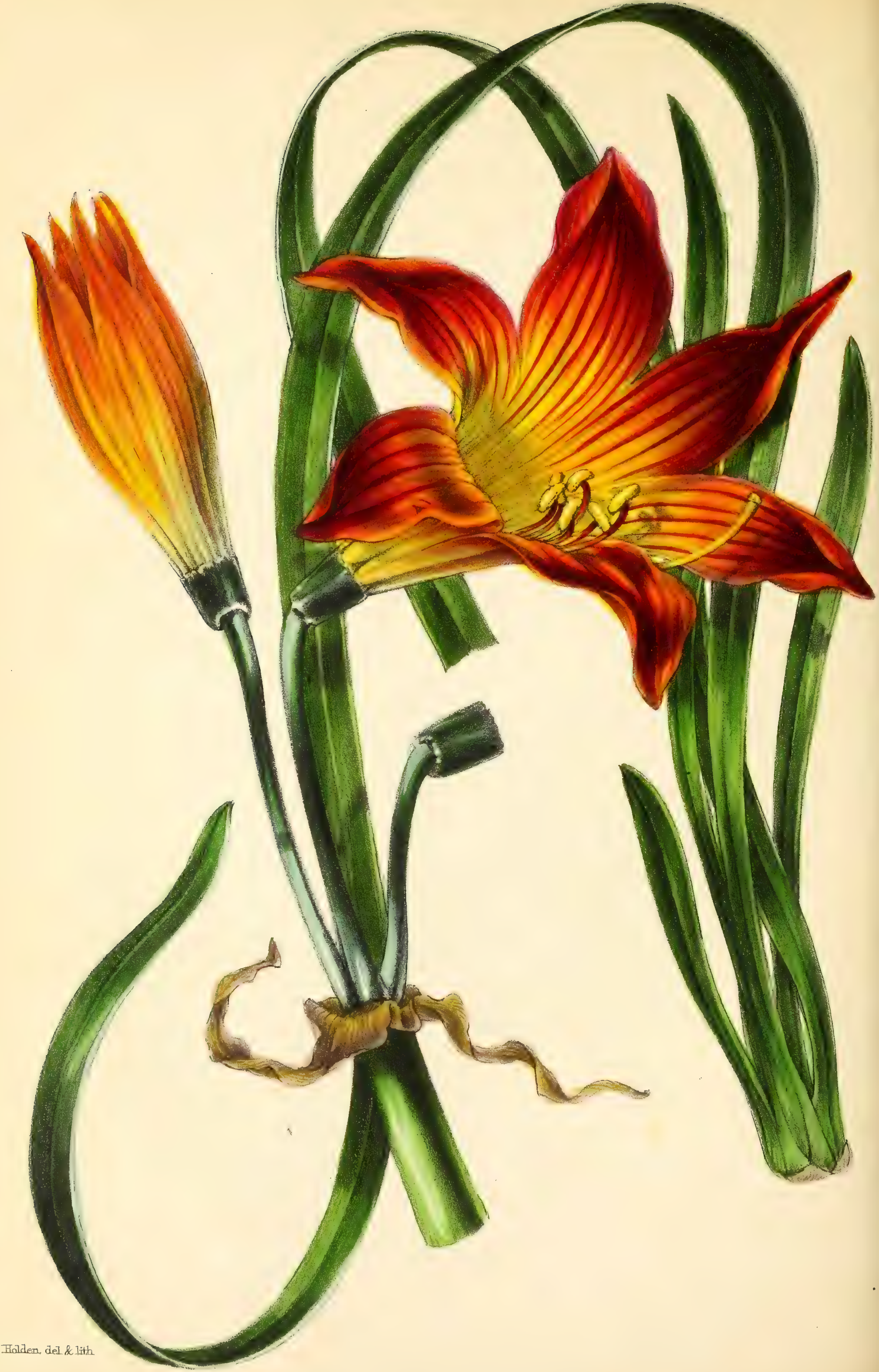
Plants should invariably be watered in this part of the year towards the evening of each day. The danger from frost is now, it is to be expected, at an end, and evening waterings allow the plants time to absorb the water gradually, and appropriate those portions that contribute to their nourishment; whereas, water administered in the morning is immediately exhaled from the soil as well as the leaves, and both its refreshing and nutrimental properties are largely wasted. Roses to watering-pots, save in particular cases, we invariably look upon as the masks of indolence. Their use tends to deceive the superintendant, when the workman is indifferent and careless, or the operator himself unless possessing great experience, and they also harden the earth, and prevent it from imbibing water in those places where it is chiefly needed. A free use of the syringe will now be highly advantageous in houses, in addition to the ordinary applications of moisture. If it merely purified the leaves, it would be of great service. But it does more. It gives them a supply of food at their surface, and enables them to elaborate more effectually the absorptions made by the roots. It is of the utmost importance that none but rain or soft water be employed.

Many cultivators avail themselves of the genial warmth at present produced by the sun, to thin the collections in their greenhouses, and place the inferior plants in the open air. Here, we must confess, there is a good motive in operation. Others, however, turn out the whole of their greenhouse plants in June, thinking that they are benefited by the change. We have endeavoured to explode the last notion by a recent paper on the subject; and we would recommend individuals of the former class to remove their best specimens to frames or pits, (of which there will most likely be some vacant,) where, by elevating them on pots till they almost touch the glass, standing them at a reasonable distance from each other, and admitting plenty of air beneath the frame as well as at the top, they will be much improved. The remainder of the collection can be left in the greenhouse till August or September.

Those tender plants that were not transferred to the flower-garden or borders last month, may be planted out now with impunity. The hints we gave in our May calendar on transplanting them can be again referred to. Those varieties which are destined to trail over the ground and cover the beds should have their shoots pegged down at the time of planting. They will thus sooner and better fulfil the object for which they are planted, and by putting a small quantity of soil on the shoots at the spot where the peg is inserted, they will be excited to emit roots there, which will alike strengthen the plant, and make the whole mass, when formed into a bed, more equal and vigorous, and will further provide strong and healthy plants to propagate from in the autumn, or to take up for keeping through the winter. Stakes for upright-growing species that need support, and trellises, or whatever else it is determined to apply to them, for climbers, should be furnished as soon as they are established; and weak specimens of every kind should be timely staked.

Half-hardy and hardy annuals may still be transplanted or thinned, and it is not yet too late to make additional sowings for the flower-borders. For the greenhouse, the like provision should be made, selecting, of course, the rarest and most beautiful of the tender kinds.

Propagation ought to be carried on extensively this month. Pelargoniums, or other plants in flower, must be slightly shaded in the middle of the day, and Orchidaceæ must be kept duly shaded. Insects should be properly kept under by water, by fumigation, or by the frequent application of a small brush.



S. Holden. del & lith.

Habranthus pratensis.

HABRÁNTHUS PRATÉNSIS.

(Meadow Habranthus.)

Class.	*Natural Order.*	*Order.*
HEXANDRIA.	AMARYLLIDÀCEÆ.	MONOGYNIA.

GENERIC CHARACTER. — *Germen* constricted in the middle; tube equal. *Filaments* declinate, fasciculate, recurved. *Style* declinate, recurved. *Seed* cumulàte, flattened, black.

SPECIFIC CHARACTER. — *Plant* a bulbous perennial. *Leaves* linear, green; convex on the back. *Umbels* two to three flowered. *Perianth* campanulate, revolute at the summit, suboblique, with scarcely any tube. *Filaments* glandular at the base. *Faucial appendages* linear-lanceolate, acuminate. *Stigma* nearly simple.

SYNONYME. *Amaryllis pratensis.*

WE owe our acquaintance with this beautiful plant, and the opportunity of having it figured, to Mr. Green, gardener to Sir E. Antrobus, Bart., at Cheam, where it bloomed very finely in the months of March and April last. It also flowered in April, at the nursery of Mr. Low, Clapton.

For the freeness with which it develops its blossoms, their extreme richness and beauty, and the length of time (compared with the duration of those of most Amaryllises and similar plants) they remain perfect, it is a very interesting addition to our gardens. It is further valuable as coming into bloom so very early in the season, and for the rather novel form of its long narrow foliage.

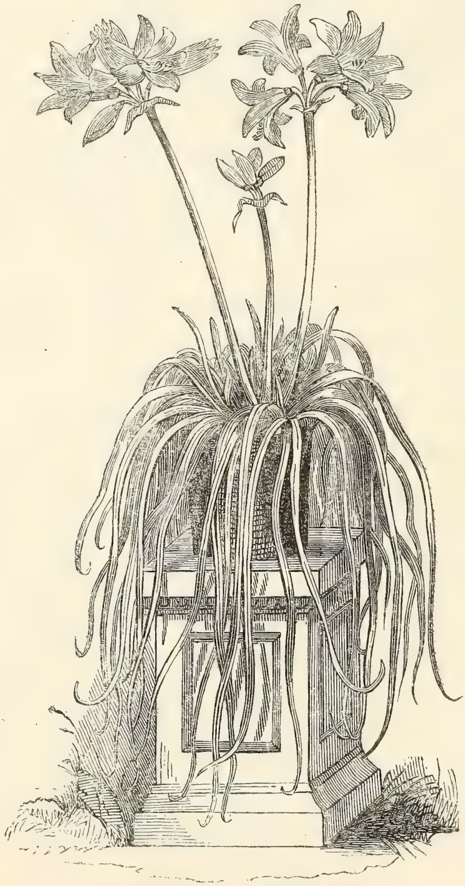
Its native country appears to be South Chile. Regarding its botanical character, Dr. Lindley remarks, in the Botanical Register, " it is upon the authority of the learned Dean of Manchester that I refer it to the *Amaryllis pratensis* of Pöppig, who says it occurs in the meadows of South Chile, near Antuco; but I have nevertheless some doubts of the identity of the plants, for the species of Pöppig is described with glaucous leaves, and serrated faucial appendages; while in that before us the latter are entire, and the former green.

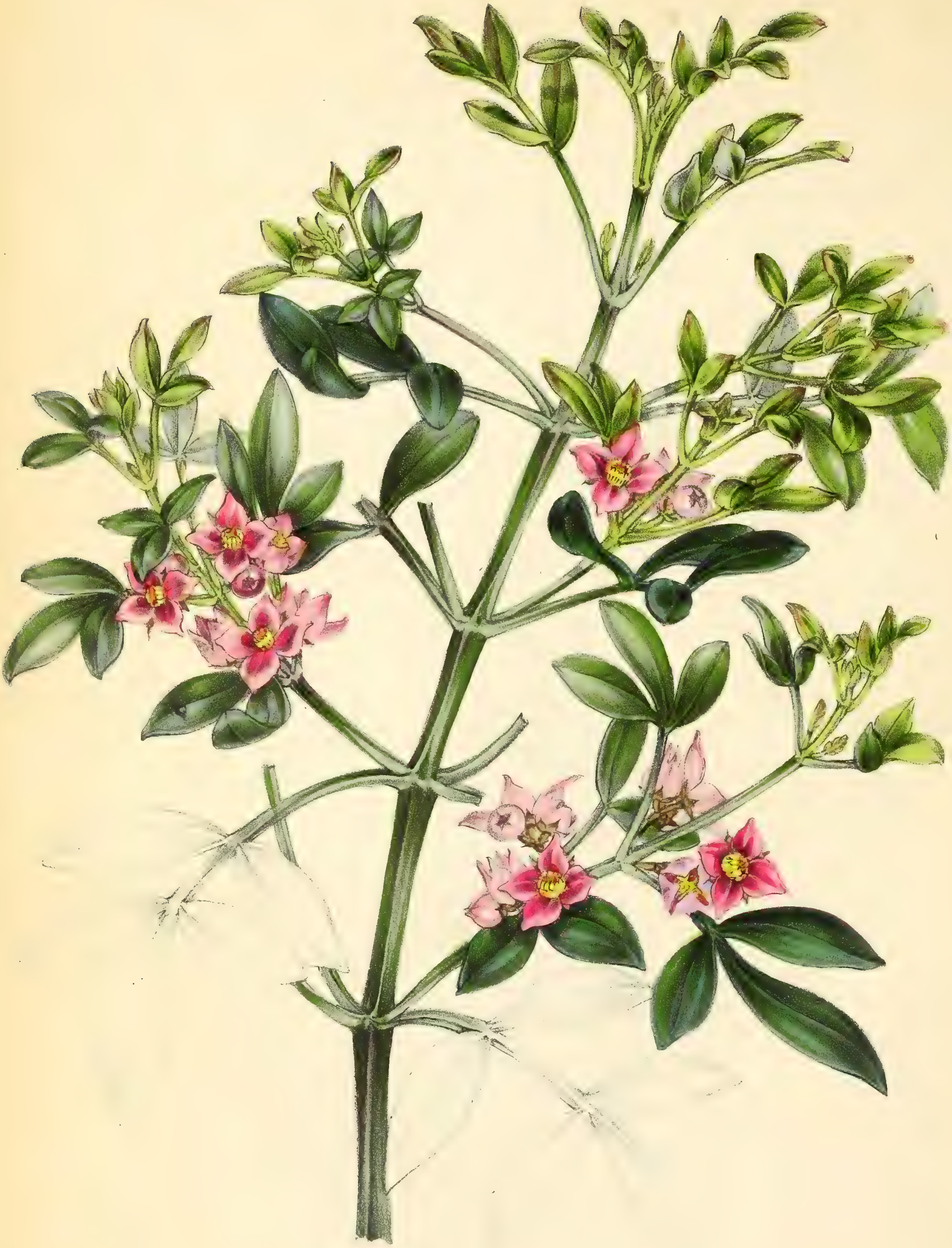
" These faucial scales are unusually large in the subject of our plate, and in fact rival what occur in the curious genus *Placea.* They are of the same nature as the coronet or cup of Narcissus; but whether or not they also represent the thick ring on the throat of Hippeastrum, and the cup of Pancratium, may be doubted."

The species seems to thrive in a very moderate stove heat, from which it may be removed to a greenhouse when the flowers open. From the time at which it blooms, and the general character of the plant, it demands all the light that can well be afforded; and the brilliancy of its colours depends much on this circumstance. Potted late in autumn, in a good loamy soil, it should not be watered much till its leaves are thrown up, from which time the quantity of water given it must be daily increased. After the flowers have faded, and the leaves are fully perfected, it may gradually be brought into a dry state, and kept thus for several months.

Habranthus is from *habros*, delicate; and *anthos*, a flower, probably referring to the texture of the blossoms.

Our woodcut below will show the habit of the species. It may be multiplied readily by offsets.





S.Holden, del & lith.

Boronia anemonæfolia.

BORONIA ANEMONÆFOLIA.

(Anemone-leaved Boronia.)

Class.
OCTANDRIA.

Order.
MONOGYNIA.

Natural Order.
RUTACEÆ.

Generic Character.—*Calyx* four-parted or four-cleft, permanent. *Petals* four, marcescent. *Stamens* eight, the four opposite the petals shortest, all shorter than the petals; free, fringed, or tuberculated, linear; usually dilated at the top, whence a very short thread arises, bearing the anther. *Anthers* heart-shaped, usually with a short appendage at the apex. *Styles* four; erect, smooth, approximate or joined together, terminated by an equal or capitate four-furrowed stigma. Fruit four two-valved carpels. *Seeds* ovate, compressed, usually one in each carpel. *Don's Gard. and Botany.*

Specific Character.—*Plant* an evergreen shrub, growing two feet or more in height. *Leaves* with long foot-stalks, usually trifid, though often with four leaflets in opposite pairs, and a terminal one; leaflets oblong-lanceolate, generally entire, acute. *Petioles* channelled. *Peduncles* axillary, one or many flowered. *Filaments* blunt at the apex. *Anthers* spurred.

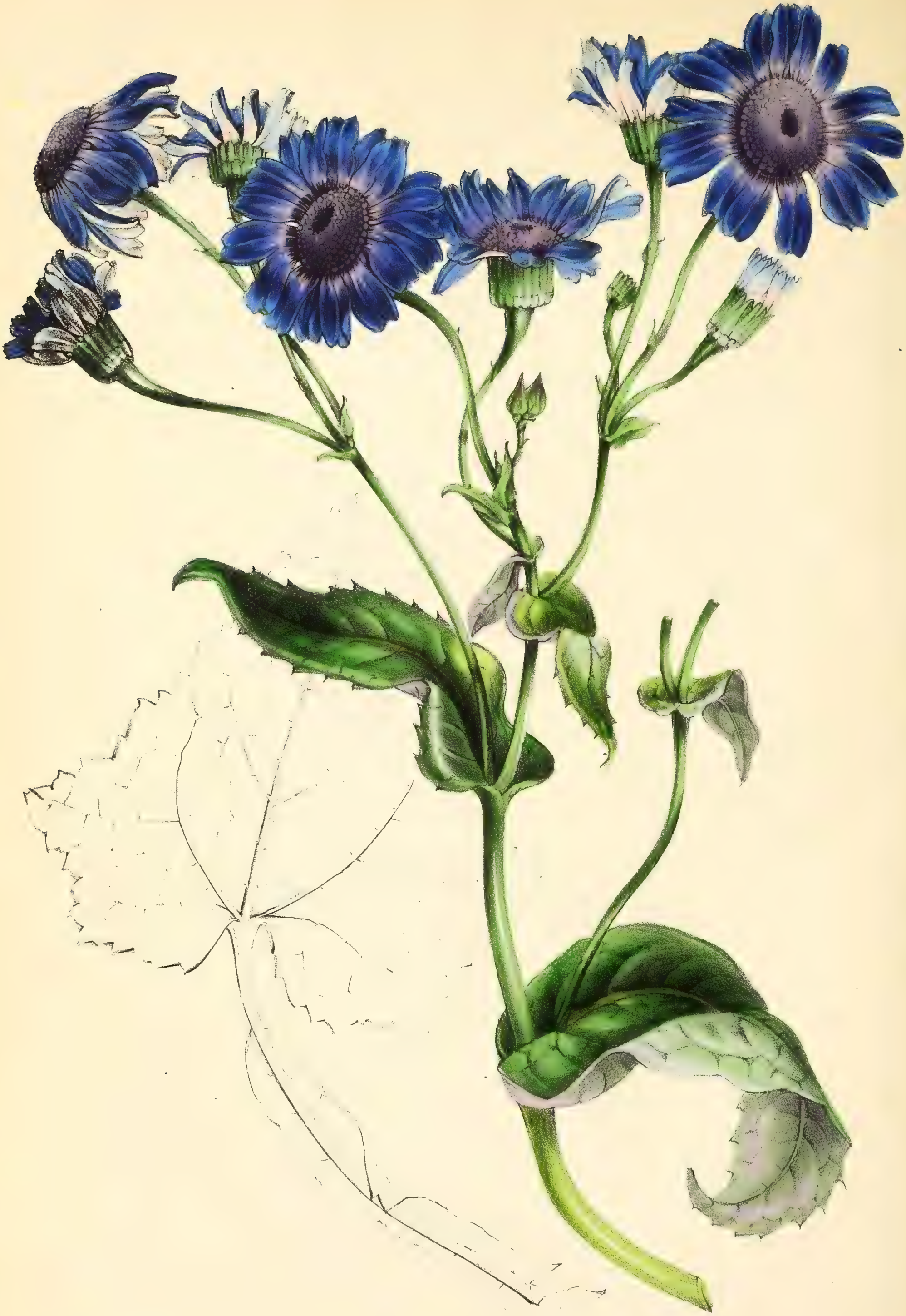
Seeds of this pretty New Holland plant were imported by Messrs. Loddiges many years ago; but though they germinated at once, the plants did not blossom till within the last two years, and we had our drawing made from the collection of these gentlemen in the month of May or June, 1841.

It is a very peculiar species, as well in the form and tints of its leaves, as in the way in which the flowers are produced. The leaves are composed of three and sometimes five leaflets, and have a bolder and more prominent character than those of any other species; they are likewise usually tinged with yellowish green or brown. The flowers, too, instead of being borne almost or quite at the extremities of the shoots, and standing out distinctly on the exterior of the plant, keep more on the lower part of the branches, and, having short peduncles, are more retiring. They are, however, very neat; of a lively pink hue, and beautifully varied by the yellow stamens in the centre. The bush, moreover, branching liberally, and being tolerably compact, has a good appearance at all times, but especially while the flowers are unfolded.

In its cultivation no unusual treatment is requisite. A light loamy earth, with a very trifling addition of heath-mould, will suit it; and it should be potted as often as may be necessary into a pot only one size larger. Particular attention must be paid to potting; for it is generally owing to a sourness or insufficiency of soil, or imperfect drainage, that plants of this character acquire a sickly aspect.

Watering is, besides, a very important point; and hard water always injures species with fine roots sooner than others, so that it should be avoided, as a source of mischief, with such plants as Boronias. Whenever the plant evinces a disposition to depart from its ordinary compactness, an occasionally stopping of the shoots will be useful: indeed, while young, the practice may be adopted with propriety under any circumstances. The young shoots thus removed can be employed as cuttings for propagation, which is easily effected in this manner.

Dr. Sibthorpe, a collector of plants, who had an Italian servant to accompany him in his tours, lost him by an accident at Athens, and commemorated his services in the present genus. His name was Francis Borone.



S. Holden del. & Lith.

Cineraria Webberiana.

CINERÀRIA WEBBERIÀNA.

(Mr. Webber's Cineraria.)

Class
SYNGENESIA.

Order.
SUPERFLUA.

Natural Order.
COMPŌSITÆ.

Generic Character.—*Involucre* deeply many-parted, without external bracteæ; lobes equal. *Receptacle* naked. *Florets* of the disk tubular, hermaphrodite; those of the rays ligulate, female. *Anthers* naked at the base. *Pappus* pilose, sessile.

Specific Character. *Plant* a seedling or hybrid, of vigorous habits, and with large, deep as well as bright blue flowers.

Hybrid Cinerarias are now becoming so numerous, that it is with difficulty many of them can be distinguished from each other; and the yearly addition of such numbers of new ones tends greatly to add to the confusion of those who desire to gain a knowledge of their peculiarities. We would by no means, however, deprecate the still further extension of the practice of hybridizing; since it has been the means of creating quite a novel and superior race in these, as well as other flowers. All we would wish to do, is to refrain from conferring distinctive titles on those which are, as it were, lost amid the crowd of varieties that resemble them, and cannot, without the closest examination, have their differences determined.

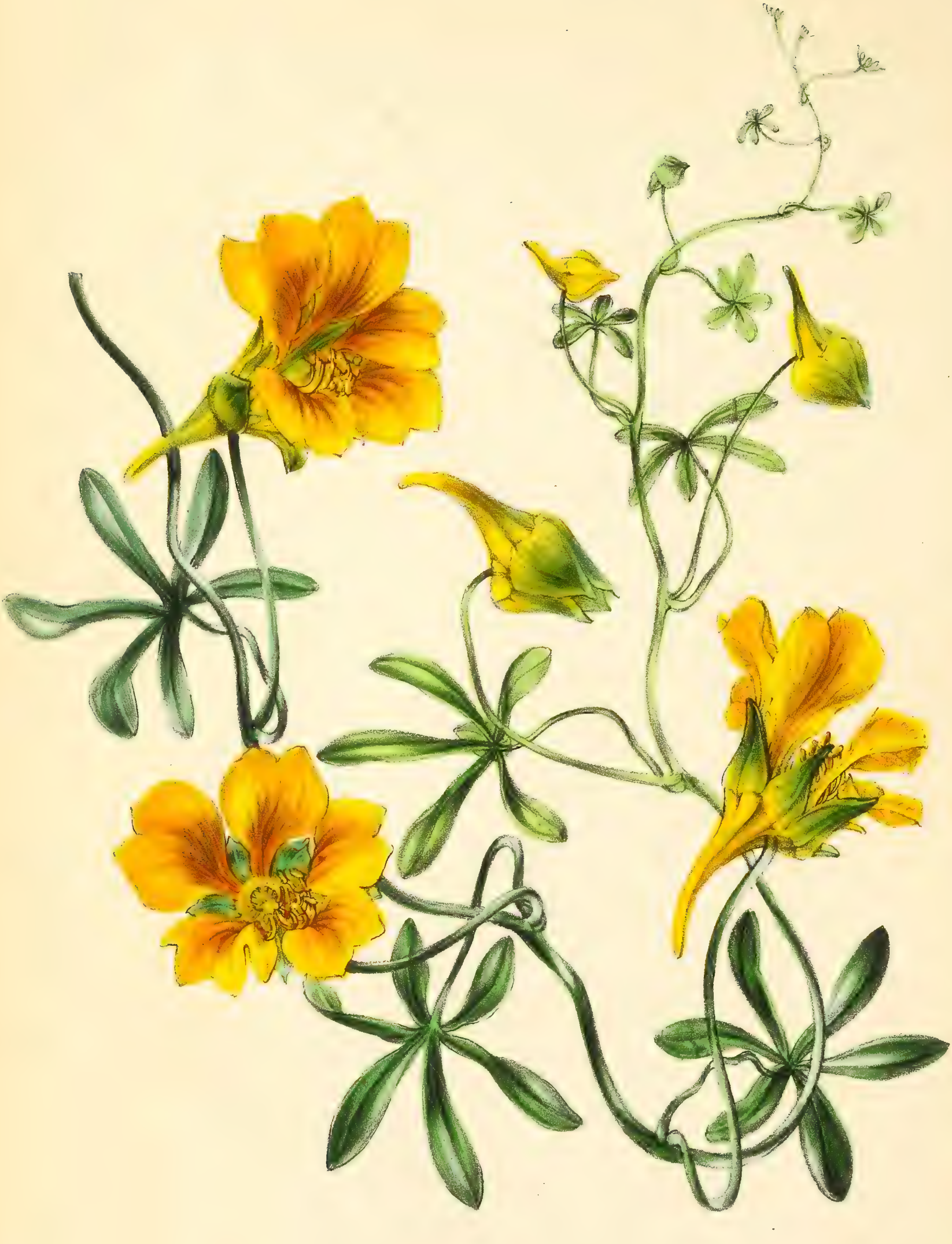
That there are hybrids deserving both notice and perpetuation as distinct varieties, the *C. Waterhousiana*, first brought into repute by a figure in the fourth volume of our Magazine, and which has ever since retained its character; with the one called King, and the *splendidum* of Mr. Green, bear abundant testimony. And we have the same friendly office now to perform for *C. Webberiana* which we did for *C. Waterhousiana.* We do it, too, with an equal degree of satisfaction, and of confidence that it will be found worthy, alike of cultivation for its own merits, and of using as a parent from which to obtain other beautiful seedlings.

It was raised in the spring of last year from seeds ripened promiscuously on a number of plants, of various kinds, blooming together, by Mr. Smithers, gardener to Robert Williams, Esq., of Bridehead House, near Dorchester. The stock being transferred to Mr. Webber, nurseryman, Merriott Nurseries, near Crewkherne, Somersetshire, and that gentleman having sent us a specimen, which was the subject of the accompanying plate, we have named it *C. Webberiana.*

In habit the plant assimilates slightly to *C. Waterhousiana*, but is a closer grower: it has ample foliage, the upper side of which is of a bright green tint, while beneath it is a rich purple. The flowers are large; not disposed in flat regular heads, but occupying various positions, at different heights. They are of a deep, rich, brilliant blue colour, which cannot well be given in any drawing.

Mr. Webber informs us, that on a specimen which was lately in bloom, the contrast caused by the light green and pale purple of the leaves, and the dazzling tint of the blossoms, rendered it very striking and attractive.

The culture of these plants is exceedingly simple. The specimens should be divided in autumn, and the divisions potted into small pots of any enriched loamy earth, shifting them repeatedly as they grow, and watering them with greater profusion as the spring advances. Preservation from frost is all they require in winter; and after they have ceased flowering in spring, they may be kept torpid (or nearly so) through the summer in a cold and partially shaded place, where rain cannot reach them.



S.Holden del. & Lith.

Tropæolum edule.

TROPÆOLUM EDULE.

(Edible-rooted Indian Cress.)

Class.	*Natural Order.*	*Order.*
OCTANDRIA.	BALSAMINACEÆ.	MONOGYNIA.

Generic Character.—*Calyx* five-parted, upper lobe furnished with a spur. *Petals* five, unequal; three lower ones smallest, or vanished altogether. *Stamens* eight, free from the base. *Carpels* three, somewhat erose, kidney-shaped, indehiscent, furrowed, roundish. *Seed* large, filling the cell.—*Don's Gard. and Botany.*

Specific Character.—*Plant* an herbaceous climber. *Root* tuberous. *Leaves* with long tortuous petioles, composed of six or seven leaflets; leaflets slightly glaucous, linear-lanceolate, acute, irregularly recurved. *Peduncles* long, glaucous, one-flowered. *Calyx* with a large spur; segments large, equal, orange-yellow, tinged and tipped with green, irregularly veined. *Petals* arising from between the segments of the calyx; upper two obcordate, emarginate, deep and bright orange; lower three smaller, broadly spatulate, also emarginate. *Stamens* inclining upwards.

Tubers of a new *Tropæolum* were received last year by several cultivators from Chili, and imagined to be a blue-flowered species till they blossomed in the present spring, which they have done at Mr. Low's and other nurseries, as well as in not a few private collections. The species here represented is the result of those expectations; and it was thought to be *T. polyphyllum* on its first developing flowers, while specimens of the same plant, in different states of health, were mistaken for the two species *T. polyphyllum* and *T. edule.* It is now stated, however, in the Gardeners' Chronicle, that the former species is not yet known to have been introduced; while the present plant is the true *T. edule,* so named from the edible purposes to which its roots are applied.

We procured our drawing, about two months since, from the nursery of Mr. Low, Clapton, with whom it had flowered as early as the end of March, and it continues to bloom in two or three suburban collections. The finest and best-grown specimen that we have seen was reared by Mr. Green, gardener to Sir E. Antrobus, Bart., who trains it to a flat trellis, and allows it plenty of pot-room.

The narrow glaucous segments of its numerously-divided leaves constitute a mark of distinction at all times. It is not a strong-growing species, varying in this respect, like *T. tricolorum,* according as its treatment is more or less favourable. The flowers (that is, the exteriors of the calyx) have a deep greenish hue while in bud, and when opened the petals are of a very showy and bright orange colour.

It is, when properly grown, a handsome plant; and will form a fine intermediate species between *T. tricolorum* and *brachyceras*, coming into flower at nearly the same period.

If the tubers are not duly covered with soil, or the pot in which they are grown be too small, or an insufficiency of water be supplied, the plant is very apt to die off in dry weather before having opened half its flowers. The remedy for this lies in the correction of those three evils. Still, an opposite extreme must be guarded against. In training it, besides using a flat trellis, the shoots should be arranged closely, or the poverty of the leaves will be too obvious, and the flowers will be too much scattered. To ensure denseness, it is better to avoid high trellises, and only to employ those which the palpable strength of the specimen renders it probable that it will thoroughly cover.

Tropaion, a trophy, furnishes the origin of the generic title, which is applied because the leaves of the earlier species resemble a buckler, and the flowers an empty helmet.

GARDENING AS A SCIENCE.

No. VI.

One of the most beautiful processes of horticulture is that of extending any given species or variety of plant by grafting. To this subject we are now led, and we propose to take a view of it in its several branches. The practice itself is old, and it is partially known by the most humble cottager of the land; but where shall we meet with the person who really understands, and can perspicuously interpret its surprising phenomena?

As a *general principle*, it will suffice to state that a branch or twig of a tree is, by one of the many modes of operating, inserted into the stem or branch of another tree *of the same natural family*—that the two members unite and form a new tree; the head so produced retaining, constitutionally, its own precise character, uninfluenced, so far as that is concerned, by the stock; the latter at the same time being equally uninfluenced by the scion or graft, though that member develop hundreds of branches and laterals, the sum of which shall in bulk exceed that of the stock, now humbled to a mere prop, in manifold proportion.

The erroneous conception that persons of comprehensive understanding have formed is surprising. We will, as a matter of mere curiosity, go back to the authority of the poet Virgil. In the second book of the "Georgics," lines 69 to 73, we find the following beautiful passage, which the classic scholar will admire, while, as a physiologist, he must repudiate the fallacy of its doctrine:—

> "Inseritur vero ex fœtu nucis arbutus horrida,
> Et steriles platani malos gessere valentes;
> Castaneæ fagos, ornusque incanuit albo
> Flore pyri, glandemque sues fregere sub ulmis."

Is it to be wondered at, when we consider the importance that was once attached to the agricultural authority of this great Latin poet, that persons should adopt the notion of indiscriminate grafting, or believe that the *arbutus* might be united with the walnut, the fruitful *apple* with the barren plane-tree, the *pear-tree* with the flowering-ash, and the *oak* with the elm?

We are but too apt to ascribe this credulity to the ignorance of superstition, and doubtless there were (as there are now) jugglers who took advantage of simplicity; but a fact is before us, discovered only three days since (June 1) while removing a dead box-tree from a shrubbery, which will prove how nature itself may assist in deluding those who do not minutely investigate. A branch of a very large Portugal laurel formed a knee, which gave it a horizontal direction about a yard above the ground. A few inches beyond the knee, this branch (an inch and half thick) came in contact with the upright stem of a strong pseud-acacia (*Robinia* *ps. ac.*) a seedling of 1831, now a powerful tree. Being ignorant of precise dates, we can only state that, at one time or other, the branch of the Portugal laurel, by the action, doubtless, of the wind, had sawed a groove into the trunk of the acacia, at the same time abrading its own bark, and becoming flattened against the alburnum of the stem. The pseud-acacia is, during its youth, a tree of remarkably rapid growth, and in the instance now alluded to, it has completely checked the farther movement of the laurel, fixed the branch, and is covering it entirely with the substance of its own bark. The branch is almost inclosed, and on a level with the great trunk; which latter, if it progress with corresponding energy, will completely cover it with the organized matter of acacia, in two years from the present period. Now, from these plain facts, we infer that a person observing a branch of one tree, say an evergreen, growing out of the substance of a second of very opposite habits, might readily presume that the union had been effected by the operation of grafting. Our own specimen demands great observation, and some experiments, which may hereafter, if they lead to any worthy results, be communicated; at present we leave the bare fact, as described, to the judgment of the reflecting reader.

The Science of Gardening, i. e. the *Theory of Horticulture*, does not require any minute definition of the mechanical detail of grafting; that, therefore, is left to the practical gardener: what we have to explain, so far as the discoveries of Vegetable Physiology enable us to do so, is the cause of those remarkable phenomena which attend every successful insertion of a graft or scion, whether that be effected by the ordinary process, by inarching, or by crown-grafting. The only distinction we shall make will consist in referring the last-named process to the operation of "budding," because they both in common require a similar condition of the stock, to ensure the successful application of the graft or bud. It is the received opinion that the natural qualities of a grafted tree, either as respects stock or scion, remain unchanged, each retaining its own individual character uninfluenced by the other. If this be strictly the case, of what utility is the practice? We will for the present dismiss minutiæ, and at once admit the general correctness of the opinion, for a genuine Ribston pippin, grafted either upon a crab, a Siberian, or pippin-stock, retains all its individual properties; while at the same time, the stock, be it what it may, is unaffected by the graft. The same may be asserted of the pear upon the quince. Let us then approach the phenomena of a grafted tree a little more closely, and no longer view them with the negligent regard of custom. Suppose a crab-stock, planted in autumn; it stands during two years in a nursery, its head untouched by the knife; it recovers completely from the torpor occasioned by transplantation, grows vigorously, and at the latter end of the third March is three quarters of an inch thick at a foot above the ground. A selected scion of the last year's wood, which has been cut off a fortnight before, is ready—it is matched and adapted to the stock a few inches above the soil. Both members are previously cut over, prepared alike, and are fitted into each other by means of a small tongue, that of the scion slipping downward into the tongue of the stock. The theory of this operation presumes that the juices of the latter are somewhat more active than those of the scion, the buds, however, of which are somewhat swollen, and prepared to expand under the impulse of the ascending sap. As a vital union of parts can only be produced by the agency of the fluid *cambium*, which connects the bark (*liber*) and sap-wood (*alburnum*) *bark must be applied* against bark, on one edge of the slips at least, and in all the four edges of the corresponding tongues. Tying, by means of ligatures, claying, and a super-covering of wet moss, are auxiliaries used to retain moisture, and exclude the oxidizing influence of the surrounding air.

Under favourable conditions of a mild, and rather cloudy April, with gentle showers, a union may be effected, and growth proceed in a few weeks; under other circumstances, a scion may live, yet remain quiescent till after midsummer. Be this as it may, not only does the cambium of scion and stock intercommunicate, and the laborated fluids of the new leaves pass downward from the scion to the stock, but a lateral, or horizontal flow takes place through the cellular substance of the medullary processes, from the bark of the scion to, and into, the alburnum of the stock. These processes, which also have been called *divergent* rays, were considered by Mr. Knight to originate in the liber, and to *converge* toward the medulla, and not diverge from it. He was perhaps quite correct, and so, in principle, may be Mr. Main; who identifies his *indusium*, or vital membrane, with the organized matter which we style cambium.

But the grand phenomena of grafting remain still to be considered: and to lead to the subject, we ask, (in the character of the inquiring reader,) why are all the future developments of the tree, above, that is, out of the graft, exactly similar to it, not partaking of, or evincing any disposition to conform to those of the crab-stock; and why, if any shoot protrude from the latter, although it be within half an inch of the point of junction, it is true to the crab, that is to itself?

When the tree was first grafted, the crab-stock, we have supposed, was three quarters of an inch broad, the scion being estimated at half that size. In a few years, the latter shall have produced a large and fruitful head, furnished with more than a hundred shoots; the former is thickened so that it measures a foot in the girth. Yet no shoot has been permitted to grow from it, and all its descending sap must therefore have been derived from the head of the tree.

It will therefore be evident, that as the matter of woody fibre, with interspersed cellular tissue, and a horizontal convergent system, are the substances which cause the enlargement of the trunk, those substances are accessories only, but totally deficient of any of those germs or vitalized buds which produce new growing shoots: and hence it follows that the scion, with its two or three buds, comprise all the microcosm, the molecular progeny of every future member of growth and fertility. On the other hand, the stock contains an infinite number of germs, or systems of life, capable of development when called into action by certain processes of stimulation.

Upon *no other principles* can we account for the unalterable character of the two members. The *creative power* is nothing more than the revelation of embryo buds already pre-existing; all the other internal circulative action, with the assimilation of substances, are phenomena purely nutrimental. So far, we may presume, or theorize, with security; but much, very much, of deep, and unapproachable mystery remains, as subjects for "admiration, the superlative of praise."

We might enlarge, but must close with one other remark. Though we admit, and, indeed, insist on, the permanence of individual character in each member of a grafted plant, we must believe that power, luxuriance, or restriction of growth, is more or less regulated by the action of scion upon stock reciprocally. A wonderful instance may be cited in proof, which was observed late in the last month at Mr. Stewart's nursery, Salt-hill, near Slough, Bucks. A yellow laburnum had been grafted with what was supposed to be purple laburnum; but the results have shown, that in all probability the scion was not true purple, but a hybrid from seed, beween purple and yellow; for the head, after producing flowers of a kind of dingy puce-pink, has at length protruded two shoots of the *true lilac* variety, distinct from, but amidst the hybrids. But this is not all; here and there a little twig with pure yellow flowers is discernible, and some of the individual flowers of the puce blossoms have half the carina, or one of the alæ, plain yellow. The object altogether is singular and remarkable.

ON SUSPENDING PLANTS IN GREENHOUSES AND STOVES.

However much the appearance of a plant-house is affected by the number of plants that are in flower, and whatever praise may be due to the practice of retaining specimens in frames, and only exhibiting them in a show-house while they are producing their blossoms, thus keeping up, in all the visitable parts of the collection, a constant display of inflorescence; it is astonishing to those who have never before witnessed it, what an immense change can be effected in the aspect of a group, by judiciously varying the position and arrangement of the individual plants. We do not scruple to assert that, while the richest masses of bloom may be rendered tame and monotonous by being formally or improperly placed; so, where there is the most palpable deficiency of flowers, a very interesting and agreeable effect may be produced by disposing them to advantage.

Unvarying slopes of surface, rising from the front to the back, or from the sides to the centre, correctly characterize the mode in which plants are commonly arranged. And though modern taste has contrived to diversify and enliven these by altering the straight lines in which stages are usually built, and by elevating handsome specimens at irregular intervals from each other, or heights or distances from the path, and by destroying the trim appearance of climbers trained to the roof in permitting their branches of different lengths to depend, and wave in the air; something still seems to us requisite in order to give that finished aspect of variety, the love of which is so general and paramount an element in the human constitution.

Every one must have admired, without any reflection on the appropriateness of such treatment to its objects, the liveliness, and elegance, and finish, imparted to a house containing Orchidaceæ, by having a portion of them hung at different heights, and in various positions, from the rafters or other parts of the roof. But in such case, the natural circumstances of the plants may be supposed to have suggested their suspension, and not a mere regard to any notions of taste. However, when it is found that, beyond the contemplated purpose of the system, it has the further merit of substituting for dulness and blankness the most delightful variety; we conceive that it would not merely be rational, but desirable, that the plan should, if possible, be applied in instances where the habits of the plants do not demand, yet can be readily adapted to, the like conditions; at least when no genuine air-plants can be made to flourish in the atmospheric circumstances commonly maintained in the house.

The project, therefore, which will form the substance of our present remarks, is to introduce into ordinary stoves, and even greenhouses, suspended specimens of those Orchidaceæ which will endure the conditions generally afforded therein; and to make up for the scantiness of such kinds by similarly appropriating species usually cultivated in those structures, whose character is either trailing, or such as to admit of being made easily pendent. We are quite aware that we cannot claim much of novelty for a recommendation of this sort. From the earliest periods, we have seen plants hanging in even cottage-windows; and the grace they have contributed to these lowly erections makes us additionally anxious to secure it more largely for ornamental structures, in which, we are constrained to think, those simple but most effective auxiliaries are too much overlooked or despised. All will perceive and acknowledge, in the decoration of an apartment, or a building devoted to the common or occasional uses of life—and, we may add, in the adornment of the person—that if some comparatively minute and insignificant article is wanting, the effect of the whole is meagre or unpolished. And what would be universally noticed here, is fully as clear to the perceptions of the observant and tasteful in the absence of suspended plants from floricultural erections. There, too, so trifling a matter has an amazing influence in giving an air of incompleteness or perfection to the scene.

It may seem ridiculous to such as think of epiphytal Orchidaceæ solely as tropical plants, and are accustomed to deem great heat and moisture essential for them, to talk of growing any member of the tribe in a greenhouse. An investigation of the natural circumstances in which some of them flourish, will, however, remove this mistake; for they are found in elevated and exposed localities where the sun shines on them almost constantly in the day, and where the temperature of summer hardly exceeds the heat of our own climate, and slight frosts, are actually experienced during winter. Such plants, then, there would be no impropriety in subjecting to greenhouse treatment; and experience shows that many Oncidia, and most Lælias and Stanhopeas, will succeed best in a warm greenhouse.

In introducing plants of either of these genera to such a cool structure, it is better to hang them beneath the partial shade of climbers, that no artificial shading may be necessary. The atmosphere of the house should also be kept a little moister in summer, which will be of great benefit to the ordinary greenhouse shrubs; since we have long entertained the belief that the arid atmosphere of greenhouses in hot dry weather must be most prejudicial to vegetation, and detract much from its healthy appearance. The best materials for suspending the plants upon, are simple logs of wood, where they will be suitable; baskets, formed of pieces of oak, hazel, or elder wood, one inch thick, and the outline of the whole contracting towards the bottom in the manner of a pot, but with a more precipitous slope; or similar baskets, for Stanhopeas, with the narrow end upwards, in order to secure the flower-scape being sent on the outside of the frame; or, still for Stanhopeas, a block of wood with three forks pointing upwards but outwards, or three pieces of wood having the same direction as the preceding, and nailed together at the base, in the hollow between the forks of which the plant could be placed. Either of these methods could be adopted, as the habits of the plants might suggest.

For a common stove, again, in which shade afforded by climbers, or that furnished by an external covering of canvas, would be useful to the plants usually grown in it, rather than otherwise, during the height of summer, and to which, moreover, atmospheric moisture is alike beneficial, there are few Orchidaceæ that might not be appropriately made use of in a suspended manner. Here, too, a more interesting class of epiphytes could be employed. We allude to those of a caulescent description, which have either drooping stems, or the stems of which assume a more graceful position, or whose roots are put forth into the air, and give them at once a grotesque and agreeable character. The many lovely Dendrobiums, whose stems would droop so elegantly if not unnaturally and injudiciously supported; the charming group of Vanda-like plants, including *Vanda*, *Sarcanthus*, *Saccolabium*, *Aerides*, *Renanthera*, &c.; the airy *Burlingtonia rigida*, and the curious species of *Coryanthes*, with others that will readily occur to every cultivator, would all grow finely in a moist and shady stove; and it is a subject of regret, that they are not more frequently or extensively cultivated in such houses.

The whole of the plants we have named might very properly be fastened to logs of wood, or planted in moss and heath mould in the baskets before described, or either of those recommended and figured in a recent number of our work. The habits and mode of growth of each species, and its prevailing colours, must decide which of the receptacles will be fittest.

But there are other modes of supporting them which ought to be noticed, because they are so exceedingly characteristic. Rude and rustic branches of trees, with all the thicker parts of their minor forks remaining on them, may be suspended over a cistern or elsewhere, and, after being enveloped in sphagnum moss, to give them a verdurous appearance, or partially covered with Lycopodiums, and such like plants, to vary their aspect, can have twelve, twenty, or more different species of Orchidaceæ attached to them, as well on the main stem as on all the branches. Or forked stumps of a somewhat larger size may be fixed in the middle of basins or aquariums, or in any other conveniently moist part of the house, and be made to resemble miniature trees, covering them as already directed. The extraordinary variety which can be given to objects of this kind is within every one's reach, and it merely requires a little taste in their arrangement.

There is an additional plan for supplying the means of support to epiphytes in stoves, which we find in use at one or two places for ferns, and which is highly worthy of being followed. It is to clothe the walls that may happen to exist in the interior with large rough pieces of bark, or logs of wood, with the bark on, sawn from the outside of the rugged trunks of trees; planting the Orchidaceæ in small cavities left for them on the surface. A blank unsightly wall is thus converted into a pleasing and serviceable object. The sole precaution that should be observed is, to plant the specimens so that their roots may rather seek the outside of the bark than turn inwards towards the wall, for they do not seem to like contact with any thing that contains lime.

A stove, too, would be materially enlivened, when it contains elevated pits, by the erection here and there of a pile, pyramid, or cone, of old roots and portions of half-decayed trees, on which to plant Orchidaceæ, &c. Tastefully put together, nothing could be more delightful than such masses; but it would carry us too far from our main point to say more concerning them.

Besides Orchidaceæ, there are numbers of plants with trailing or climbing habits, which, if suspended in the greenhouse or stove, would thrive quite as well as they do when commonly treated, and form altogether novel features in those erections. To speak first of stove species, the several kinds of *Æschynanthus* are admirably suited for the purpose. Fastened on a log of wood, with just their principal roots protected by moss, or placed in a wire or rustic wooden basket, filled with sphagnum moss, they would be receiving the most suitable management that could be bestowed, and their branches, hanging down into the air, and flowering at their extremities, would have a singularly ornamental effect. *Columnea Schiediana*, treated in the same way, only favoured with a little soil in the basket, or even hung up in a small pot, which its branches would soon surround and conceal, would make another attractive specimen. We have no doubt, likewise, that *Columnea scandens* would succeed equally well, and be fully as handsome, in the same circumstances. *Billbergias*, *Dyckias*, and their allies, with a small ball of moss tied round their roots, we have lately seen depending from the roof of a stove, and blooming in this way almost immediately, while other and similar specimens had been several years in pots without flowering. *Russellia juncea* is well known to look best when hung up in a pot; its interesting rush-like branches, prettily studded with their bright red blossoms, waving airily far beneath the bottom of the pot. From the beauty which we have observed Thunbergias exhibiting when trained to a trellis beneath the pot in which they were growing, we should judge that they would be particularly fascinating if suspended as we have suggested, and their branches left to depend naturally. The points of the shoots might sometimes require a little checking, but this could be done with the greatest facility. The varieties of *alata*, and all the kinds related to it in habit, and in the form of their flowers, are what we allude to. In the same way we believe *Lantana Selloviana* would compose an elegant mass, though it might be grown as well in the greenhouse.

That some of the epiphyllous sorts of Cacti will grow most luxuriantly in moss, either fastened by wire into a ball or placed in a wire basket, is a fact that needs not now to be confirmed. *Cereus speciosus*, *Epiphyllum Ackermanniæ*, *splendidum*, *alatum*, and others, with *Cereus flagelliformis*, are very engaging when so cultivated, and the last named plant may also be kept in a pot: of course, we mean that all should be suspended. *Epiphyllum truncatum* and its varieties, when reared from cuttings, have a beautiful effect when suspended in a small pot. Ferns, moreover, and Lycopodiums, present an almost endless variety of subjects for such management.

It would be tedious to go on enumerating species, and we shall only add, that if the atmosphere of the stove be kept moist, *Ficus elastica*, a great quantity of the stronger Ferns, some Catasetums and Grammatophyllums among Orchidaceæ, and doubtless most of those shrubby or other plants that emit their roots into the air, will thrive in perfection when simply suspended, without either soil, moss, pot, basket, or anything else about their roots. Experiments are, however, much needed on this matter, and their results could not fail to be interesting.

One other stove trailer, half an epiphyte, which we have omitted hitherto to mention, deserves prominent notice on account of its extreme suitability to our purpose. It is a species of *Chlorophytum*, probably *orchidastrum*, which protrudes long shoots all around it, that hang down in the air, bearing shoots, roots, and panicles of pretty white flowers at intervals of nine inches or less. It flourishes in either soil or moss, and is an excellent plant for affixing to those small tree-like branches that we have previously spoken of as well adapted for sustaining Orchidaceæ.

Perhaps, while the application of the system we have propounded will not be questioned in reference to stove plants, it will be disputed when brought to bear on greenhouse species. To these, then, we shall now direct our observations. The very beautiful *Saxifraga sarmentosa* is often suspended, both in windows and greenhouses; though not, we think, with a frequency proportionate to its deservings.

Linaria Cymbalaria also, though common on most old walls in some districts, and occasionally seen hung up in cottages, is every way worthy of suspension from the roofs of greenhouses, where it produces a most charming effect. *Fuchsia radicans*, and a kind called *decumbens*, which we have observed in the Epsom nursery, are very appropriate for hanging up to a roof in pots. The prostrate Verbenas might, by a slight preparation, be made to look well in a like position; as might likewise *Lobelia Erinus* and its allies, with *Mimulus moschatus*, and the varieties of a kindred nature.

The species of *Mesembryanthemum*, or the more trailing of them, with *Campanula rupestris*, *fragilis*, *hirsuta*, and a multitude of plants that resemble them in their growth, might, by a trifling share of attention, be rendered admirable objects for suspension. The treatment they would need is, to stop the shoots that are inclined to ascend, encourage those which evince a tendency to curve over the edge of the pot, and pick off the flowers that show themselves on the upper surface, to throw more strength into the pendent branches.

Another group, that only demands a little management to become some of the very best subjects of the suspension we propose, consists of the dwarfer and less straggling sorts of climbers. It is notorious that the branches of climbing species will hang down if not upheld by anything; and, by a timely suppression of extra luxuriance, or by shortening the main shoots so as to prevent them from extending too far, as well as to occasion a free development of laterals, they will soon become all that could be desired. The Kennedyas will aptly illustrate the class of which we are speaking.

Even some annuals, flowered in early spring, such as *Nemophila insignis* and *atomaria*, *Nolana atriplicifolia*, &c., create an exceedingly good display, when suspended in pots in the greenhouse.

But our space enjoins us to finish this paper, which we shall do by suggesting, that as the plants we have named, with those many others to whose appropriateness for similar ends the habits of these will serve as a guide, can with readiness be made to grow downward; or rather, as their branches depend naturally, or may by culture be induced to do so; it would be adding a fine and engaging feature to both greenhouses and stoves, to place them sparingly, and in the greatest variety, along the edges of stages or pits, and let their shoots hang down on either side of the walk, whether this be flanked with a plain wall, or the open spaces beneath the stages. Here we mean, as will be perceived, that they should be grown in pots; but where there are pits, it would not be amiss to construct a narrow channel or gutter, about three inches in breadth and depth, on the top of the wall, or to widen the latter, so as to leave holes, from four to six inches in diameter, at certain distances along the curb, with the view of planting in both specimens of the description of plants herein set forth. We are satisfied, from what we have witnessed, that this practice would produce a degree of elegance to which most persons are yet complete strangers.

REVIEWS.

Sir Uvedale Price on the Picturesque. Edited by Sir Thomas Dick Lauder, Bart. In one Volume, 8vo, beautifully illustrated by Sixty Engravings, designed and drawn on the Wood by Montague Stanley, R. S. A. Orr & Co.

Landscape gardening, though one of the finest of all the fine arts, requires to be studied with such intense devotion, that hardly one in twenty of those who practise it, ever attain to a correct knowledge of its leading principles. Those who have travelled much or little through the country, noticed the chief features of some of the finest places, and assisted, to a greater or less extent, in the practical effectuation of plans, generally imagine themselves capable of improving the landscape in gardens; and, moved by a powerful impulse to be always doing something, are constantly introducing or suggesting alterations, which, if not in direct opposition to the rules of taste, are rarely free from glaring faults. Others again, who are well grounded in all that elementary learning which is so essential to the landscape gardener, have frequently had too few opportunities of observation or practice; and hence, are apt to sacrifice convenience and propriety, in order to produce a generally great and striking effect.

It is scarcely necessary to point out that extensive observation and experience should be combined with the other requisite acquirements to form a good garden artist. But it is with the last that we have now to deal. An art that associates, in itself, the elements of poetry, painting, sculpture, and architecture, or collects materials from each or all of these to enhance the interest of its creations, cannot be expected to be properly carried into use unless its professors have a tolerable acquaintance with those related subjects. Nor can metaphysics be well excluded from the list of requirements; for, while we would not insist on a profound intimacy with its abstract laws, how can those who seek to impress and please the human mind, beyond mere superficialities, hope to accomplish this without knowing more of the workings and propensities of that mind than is to be obtained from casual notices of daily life? Such notices could be of no value except as they are systematized and concentrated into principles; and a whole life might be spent to comparatively little purpose in the process, whereas more ample information is within every one's reach in books. It must not be conceived, however, that we undervalue observation. Pursued with the assistance of the best authors, it is of immense use; but it needs the guidance, direction, and modification of scientific writers.

These remarks on the necessity of laying a firm foundation in established principles may be briefly brought to bear more immediately on the work before us. Many terms are known to be employed by which the different styles of ornamental gardening are designated. There is the trim, artificial, or geometrical system, which consists of formal figures, rectangular lines, and symmetrical proportions, adapted to that portion of a garden which is immediately connected with a building in the Grecian or Italian style of architecture. Then there is the mode of arrangement which may be styled the beautiful in gardening, but which some call the gardenesque, in which there is a greater variety and irregularity than in the preceding, yet much of polish and elegance, and no rudeness, wildness, or rusticity. The grand style, again, demands that every thing be on a large scale; broad and noble walks, immense and sweeping glades of lawn, stately avenues, expansive lakes, gigantic specimens and huge masses of trees, and, in the distance, a magnificent park and plantations, with a prospect that includes nothing but what may be supposed to be within the limits of the estate.

Lastly, there is the picturesque style; of which ruggedness, abruptness of change and contrast—all the features we have mentioned as being remote from the beautiful—rivers dashing among rocks and forming foaming cataracts; deep and precipitous ravines; rocky caverns; rustic bridges, arbours, or cottages; scathed, half prostrate, decaying, and ancient trees; with the absence of most that is artificial or cultivated; are a few of the principal characteristics. And in naming the picturesque, we are naturally led to the book under review.

This valuable work should be in the hands of every landscape gardener and architect; and, indeed, of every one who has or may have anything to do in laying out gardens, or the improvement of scenery. The numerous foot-notes which very much interfered with the careful reading of the last edition, are judiciously embodied in the text of this; and the frequent and very excellent remarks of the Editor are introduced in the same manner, but placed between brackets to distinguish them. They greatly increase the value of the work, which is replete with useful instruction relative to the composition of the picturesque in landscape gardening, taking the principles laid down by the great masters in painting as a guide. We would not be supposed to advocate this before design, or the gardenesque style of landscape disposition, but would rather impress how essential a knowledge of both is. It is impossible to derive an accurate familiarity with either from perusing books in which they are attempted to be blended. We would have every style investigated separately, and its applicability to particular circumstances or sites thoroughly understood. That attained, the professor might fix upon any one as the nature of the domain dictated, or so unite the more harmonious peculiarities of two or more as to embrace the varied character of a place, and accommodate the whole thereto.

With such an impression, we most cordially welcome this improved Edition of Uvedale Price, and sincerely recommend those who fortunately possess Mr. Loudon's edition of Repton's Landscape Gardening to procure this. They were contemporary authors; the two editions now spoken of are of the same size, beautifully got up, and well fitted to occupy the same shelf as auxiliaries. The attentive study of Uvedale Price will enlarge the ideas, and give just notions of taste in the picturesque, while Repton's work will enable the student to modify these, and put them into execution.

We may take the present occasion for stating how much the public are indebted to Mr. Loudon for bringing out Mr. Repton's works in the present form. Their enormous price rendered them before quite unattainable to the majority; and yet no book of the kind is more calculated to be serviceable to practical men, because, while fundamental principles are duly explained and insisted upon, their application is so clearly shown, and the hundreds of examples given may be so readily examined, that we should fancy that a visit to the places described, with the book as a companion, and a tasteful friend with whom to discuss the different topics treated of, would be nearly sufficient to make any properly educated and well-informed gardener a proficient in this delightful art.

As it is a curious fact that all landscape gardeners, or writers on the subject, have been extravagant in their advocacy of certain favourite opinions, and as most of them have entertained views, too, which are but lamely supported by argument, or at variance with taste; we must caution the inquirer against following implicitly either Repton or Price, or any previous, modern, or living author. No one can ever excel in landscape gardening, who does not aspire to something beyond a copyist; since it is notorious that every mere imitator always perpetuates the defects, and seldom reaches the higher qualities of his adopted exemplar.

Loudon's Encyclopædia of Trees and Shrubs; being an Abridgment of the Arboretum et Fruticetum Britannicum. Longman and Co.

While none but the original edition of this important work existed, gardeners, and the admirers of trees and shrubs whose means were not of the most ample description, were entirely precluded from purchasing it by its high price. Now, however, it is relieved of the four volumes of portraits of trees, and of the historical, poetical, and other associations which were inserted at great length in the letter-press, and is brought, in one volume, within the grasp of all who covet the immense mass of real information it contains.

We have before bestowed so much praise on the work, that little is left for us here but to refer back to the last volume of this magazine for our opinions. And though these were given on the eight-volume edition, we have there said nothing that will not apply to the present. Not but that all which has been taken away was in the highest degree interesting, and the wealthy will yet prefer the first edition. Still, the matter removed was of no positive value in a practical sense; and the descriptions, remarks on culture, outlines of the uses in a medicinal or other point of view, and the wood-cuts, will enable any reader to discover the name, treatment, and importance of any arboreous plant he may meet with. Indeed, this edition has many engravings which were not in the previous one, only six described species being unillustrated. It has also an analysis of trees and shrubs according to the purposes to which they are applicable, with another and very elaborate one in reference to the form and arrangement of their leaves. The latter will greatly assist the botanical student, and both must be of essential service to the planter.

Many passages might well be transferred to our pages with a view of showing the character of the work; but it would require the most copious extracts to give a full idea of its varied contents. We have only room for two. The first is from the observations prefixed to each of the natural orders, and relates to *Rosaceæ.*

> "There are two characteristics of this order, with reference to its cultivation, which are of great importance to the gardener; the first is, the liability of almost all the species to sport, and produce varieties, differing, in many cases, more from one another, than they differ from other species; and the second is, that they are remarkably subject to the attacks of insects and diseases. They almost all require a free loamy soil, not overcharged with moisture, and rich rather than poor; and, while all the species are increased by seeds, which, for the most part, are produced freely in Britain, or by cuttings of the roots, almost all the varieties are best increased by grafting or budding; and not, as in some other orders, with equal ease, by cuttings of th shoots, or by layers.
>
> "With reference to landscape gardening, all the rosaceous trees have three properties, which deserve to be kept constantly in view by the improver of grounds; 1st, they never attain a large size; 2nd, they attain their natural size and shape in a very few years, in good soil not requiring more than from ten to twenty years; and 3rd, they sooner take the character of old trees, than the trees of any other natural order of ligneous plants. A few exceptions may be taken from different orders, such as the common field maple, the common laburnum, &c.; but we know of no natural order, in which, like the Rosaceæ, all the trees are low or middle-sized, and all take the character of age, while comparatively young. Hence their value in laying out small places, where the object is to make a new place appear old, or a small place appear large; and, at the same time, to combine character of form with beautiful blossoms in spring, and showy (Cratægus, Cotoneaster, and Amelanchier) or useful (Pyrus and Prunus) fruit in autumn."

No one can be at a loss to perceive the usefulness of such observations. But these are only general, and every genus is similarly remarked upon, together with each individual species that is sufficiently ornamental; so that the book is not merely occupied with botanical and popular descriptions and such like details, but is an admirable guide to the planter. And as trees and shrubs give the principal tone to a landscape, this work may be considered of the highest value to the landscape gardener. We cite another paragraph because it refers to a new plant that has excited much notice—*Paulownia imperialis.* After giving the generic and specific characters, with other particulars, it is stated that the plant is a magnificent deciduous tree, native of the southern provinces of Japan, in exposed places. It grows in Japan to the height of thirty or forty feet, with a trunk two to three feet in diameter, and purplish flowers, which appear there in April.

> "The branches are few, but strong, and proceeding from the trunk at right angles. The flowers are in large bunches, which look, at a distance, like those of the horse-chestnut; while the individual flowers, in form, size, and colour, resemble those of *Digitalis purpurea.* The tree was introduced into Europe in 1837; and in the Jardin des Plantes, there is a specimen which has stood out three winters. In July, 1840, it was nearly twelve feet high; and, in all respects,

closely resembles a Catalpa. It is readily propagated by cuttings of the roots or shoots ; flowers vigorously in any common soil, tolerably dry ; and will, doubtless, speedily become as common as the Catalpa throughout Europe." It is now in most nurseries.

We very frankly and warmly advise all gardeners, nurserymen, and the proprietors of gardens or land, to procure this abridgment of the *Arboretum et Fruticetum Britannicum.* We are sure they will find themselves abundantly repaid for its cost.

FLORICULTURAL NOTICES.

NEW AND BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR JUNE.

ACHIME'NES PEDUNCULA'TA. Another elegant species of *Achimenes* collected by Mr. Hartweg, and sent to the Horticultural Society at the same time as *A. longiflora* and *rosea,* with which also it flowered for the first time in September, 1841. " In appearance it is more like a *Gesnera* than an *Achimenes ;* but if the limits assigned to these genera by De Candolle are the true ones, Mr. Bentham has rightly placed it in *Achimenes,* for it has a cup-shaped disk, and distinct anthers, which appear to be among the most important attributes of the latter genus. It has, too, the thin soft foliage of *Achimenes* instead of the thick coarse leaves of a *Gesnera.* In a cultivated state the appearance of this species is much improved. The wild specimens have larger leaves and smaller flowers, and look like drawn up plants pulled out of a thicket, where they had been struggling with darkness and a scanty soil for their existence. In the hot-house the flowers are more numerous, larger, and of a peculiarly deep scarlet, richly marked with rows of crimson spots." The leaves are ovately cordate ; both these and the stems are covered with down ; and the peduncles are peculiarly long, bearing one or two flowers, but usually only one. *Bot. Reg.* 31.

CŒ'LIA BAUERA'NA. A mistake has for some time existed regarding the botanical structure of this genus, the flowers of which were described by Mr. Bauer as having four pollen masses, of a concavo-convex form, " so that lying in pairs, side by side, each pair formed a hollow body, narrower at back than in front." Dr. Lindley finds, however, that there are really eight pollen-masses, " placed in fours in double pairs, and of the supposed hollowing out no trace is discoverable ; but they are as usual plano-convex, and are bound together by a powdery strap. The West Indies and Mexico produce this little epiphyte, which, although white and inconspicuous, is, like our own Lily of the Valley, so sweet that it must take precedence of most of its race. No Hawthorn hedge is more fragrant than a bed of this Cœlia." It is best cultivated in a cool stove, suspended from the rafters on a block of wood. " It grows fast, and is easily multiplied." *Bot. Reg.* 36.

E'RIA POLYU'RA. " Of the now very numerous species of Eria, this is one of the more graceful, producing from the sides of long leafy fleshy stems a profusion of delicate tails of flowers, each nearly six inches long. The flowers resemble little semitransparent bells, just tinged with pink, and having a rich purple and yellow centre. The latter appearance arises from the labellum, which is ovate, heart-shaped, and a rich port-wine purple, with a bright yellow tip. Mr. Cuming found it in Manilla, and sent it to Messrs. Loddiges, with whom it flowered in October, 1841." From *E. floribunda,* to which it approaches, it differs in having larger flowers, drooping racemes, and a broader as well as other formed lip. It is very easily grown in a moist Orchidaceous-house. *Bot. Reg.* 32.

HELLE'BORUS ORIENTA'LIS. The deadly poison called by the ancients Black Hellebore has commonly been attributed to *H. niger,* or the Christmas Rose, a most beautiful and hardy winter-flowering perennial. But there is a difficulty in reconciling this with the description given by Dioscorides, who speaks of the flowers as 'purplish,' those of *H. niger* being white ; and hence it is now thought that *H. orientalis*, which correctly answers to that character, is the genuine Black Hellebore. The roots were gathered on the Bithynian Olympus by Mr. Sandison, Her Majesty's Consul at Brusa, and sent to the Horticultural Society. "No doubt this is hardy, although, on account of its great rarity, it has at present been kept in the greenhouse. If so, and it should flower at the same time as the Christmas rose, as is probable, it will be a welcome addition to our collections. In the greenhouse it flowers in February and March, and requires rather a damp shady situation, with peaty soil to grow in. It is easily increased, either by dividing the old plants when sufficiently large, or by seeds, which should be sown directly they are ripe." *Bot. Reg.* 34.

Mimo'sa Urugue'nsis. "A pretty greenhouse shrub, very nearly hardy, which would no doubt improve much in appearance under the hands of a good cultivator, and it would reward his pains." It is a native of the province of Buenos Ayres, whence seeds were received by the Hon. W. F. Strangways, and given to the Horticultural Society. It has a few strong thorns on its stems, and the leaves have from eight to twelve pairs of narrow leaflets. The flowers have the aspect of a ball of crimson stamens, tipped with yellow anthers. "It requires such protection in this country as is given to Verbenas, Acacias, and things of that description. It grows well in a mixture of light loam and leaf mould, and may be readily propagated by cuttings in the usual manner." *Bot. Reg.* 33.

Rhodode'ndron anthopo'gon. "The Countess of Rosslyn has taken great pains to form, at Dysart House, an unusually extensive collection of the different species and superb varieties of *Rhododendron;* and placed there, under the judicious management of the gardener, Mr. Blair, they flower in a manner certainly not surpassed in any collection in Britain. Among these, the rare species now described forms a dense bush. It was obtained from Messrs. Loddiges five years ago, and during each of the last three years it has flowered in the open border abundantly in April, and partially in August. It is a native of the Himalaya mountains, and extends, as we are informed by Dr. Royle, along the range from Nepal to Cashmere, never descending lower than 9,000 feet above the level of the sea, but rising to an elevation exceeding 14,000 feet, with the last remains of woody plants." The shrub grows from a foot to eighteen inches in height, is very bushy, and has its branches, as well as the lower part of its leaves, clothed with brown scales. The flowers are small, and yellowish white.

OPERATIONS FOR JULY.

The present month is naturally both a hot and dry one, and the lengthened drought by which it has been preceded will have caused a large demand for water to be now experienced, in regard to plants in the open ground. Half-hardy sorts that have been planted in the borders, annuals, transplanted shrubs, and even many common herbaceous plants and evergreens, will have made little or no real progress during the last six weeks, and some will hardly have been kept from perishing.

All these will need to be watered most abundantly at this season, unless there is a timely and frequent supply of rain. They should always be watered in the evening, after the sun has ceased shining on them, when it will be of great service to sprinkle water over their leaves likewise. When watering is once commenced, it should never be abandoned till rain falls in the requisite quantities; for a plant which has been left wholly to nature, will sustain drought far better than one which has been artificially furnished with fluid. Water, too, should always be administered very copiously, as the amount of evaporation daily going on at this period is astonishing. It should, further, be rain-water, or that from an exposed pond, reservoir, or river, and not from a spring, which last has a great tendency to harden the ground. To avoid the latter circumstance, moreover, water should be applied to each individual plant through the spout of a pot, and not poured over a whole bed with a rose. We have repeatedly and very recently seen beds of plants that had been watered by a rose, and the surface-soil was baked together into a crust almost as hard as concrete. This would have been obviated by watering through the spout alone; but where it does occur, it is necessary that the earth be loosened and stirred frequently with a small fork, to render it pervious to water.

What we have said on watering may have the appearance of triteness, yet the subject is of too much moment at present to permit us to pass it over. To plants in pots, the same general principles may be extended. Beautiful specimens of fine-rooted species are now best kept in frames, which serve materially to ward off the rays of the sun from their roots, and in which they can more readily be preserved moist. At this time the cultivator is often annoyed by seeing valuable plants sicken and die away in a few days ; hence the necessity for looking carefully after them, to prevent the sun from injuring their tender roots, and to see that the soil in which they are planted does not become hard and impenetrable to moisture. Sometimes the largest administrations of water have no effect, because they pass off down the sides of the pot, without entering the soil : it is therefore advisable to stir the surface of the earth occasionally, and thus keep it constantly open.

To guard against the influence of the sun on the roots of susceptible plants, they should be placed where their pots are sheltered from its rays, or the pots containing them should be put in other and larger pots, and the interspace filled with moss, sand, or porous soil. By keeping these perpetually watered, a delightful moisture will be retained about the roots lying near the sides of the inner pot. It should also be provided, that each specimen do not want for pot room, so that the majority of its tender rootlets do not come into direct contact with the heat-absorbing surface of the pot.

Pelargoniums that have shed their flowers should be at once cut down, disrooted, potted in smaller pots, and put in a close moist atmosphere, that they may have every assistance in developing their new shoots. The cuttings can be made use of in propagation, for which a very little heat, but a confined shaded place, will be requisite ; and both the young and old plants must have their shoots again stopped if they grow straggling, or are not duly bushy.

The growth of Cactæ and Indian Azaleas ought to be now attended to, and they should be watered profusely. It is injudicious to expose them yet to the open air, as the tissue of the shoots or leaves is too delicate at present to bear such conditions, and they will perfect themselves better in a light house, where too much air is not afforded.

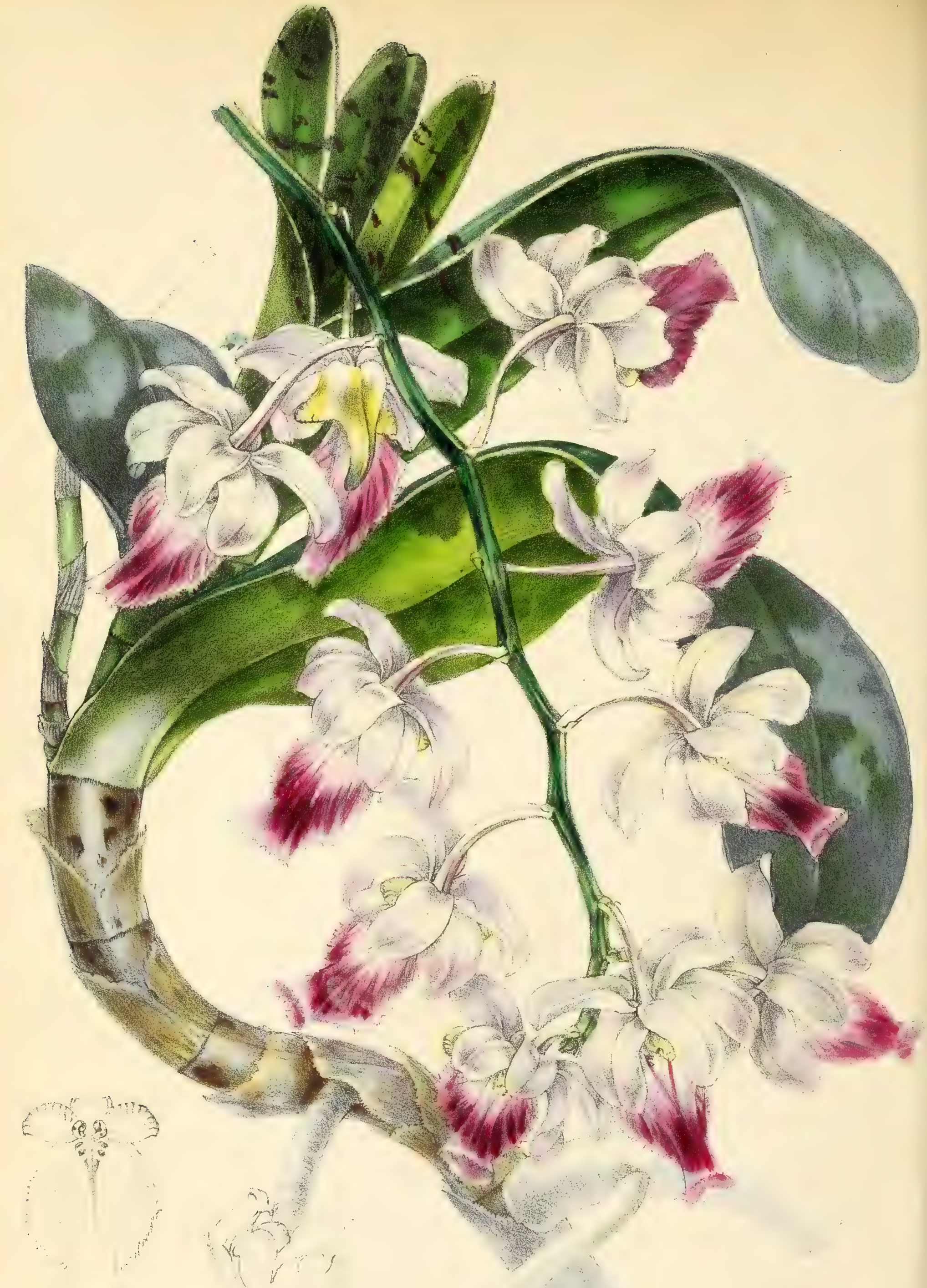
Bulbs of *Amaryllis* and other stove and greenhouse plants can be put together in a pit or frame where they will be near the glass, and where the influence of the sun, with the gradual diminution of water, will mature them, and cause their leaves to wither. Never allowing the foliage to flag is a good criterion of the quantity of water to be given ; and they may be kept as near to that state as possible. Crocuses, with those corms and bulbs that are hardy, should be taken up at this time, once in two or three years, and kept in dry boxes till the autumn.

More air may now be given to the stove and greenhouse, and likewise to the Orchidaceous-house ; the latter should still be shaded. The plants having by this time, for the most part, completed their developments, a free current of air will assist in hardening and ripening them ; or, at any rate, will tend to make them robust and healthy. All that are wished to be propagated can be increased this month with the greatest facility by cuttings, and budding may be commenced wherever it is applicable. Heaths will demand shading at this season.

Tender herbaceous or subshrubby plants in the open ground will have been thrown rather into a flowering than a growing state by the late drought ; they will therefore be benefited by having the flowers picked off, and by being liberally watered. Although this is the time at which they ought to come into bloom, the culturist must not scruple to take away the blossoms on that account, or their subsequent display will be extremely deficient.

A few annuals may yet be sown in the borders, and others in pots for the greenhouse. In sowing seeds it is well to steep them, particularly the larger ones, in water for a short time previously. This induces them to germinate much sooner ; but they must not be suffered to want water after being sown.

The principal shoots of climbers should be kept fastened in, and the minor ones left to stand out from the wall or trellis, for effect. The stems of Chrysanthemums, and all those plants that need supporting, should be staked at an early period. Seeds can be saved from annuals, or any plants producing them ; selecting those specimens which have borne the finest flowers, and preserving only the best ripened of the seeds.



S. Holden. del & lith.

Aerides Brookii

AÉRIDES BROÓKII.

(Sir William Brooks's Air-plant.)

Class.
GYNANDRIA.

Order.
MONANDRIA.

Natural Order.
ORCHIDÀCEÆ.

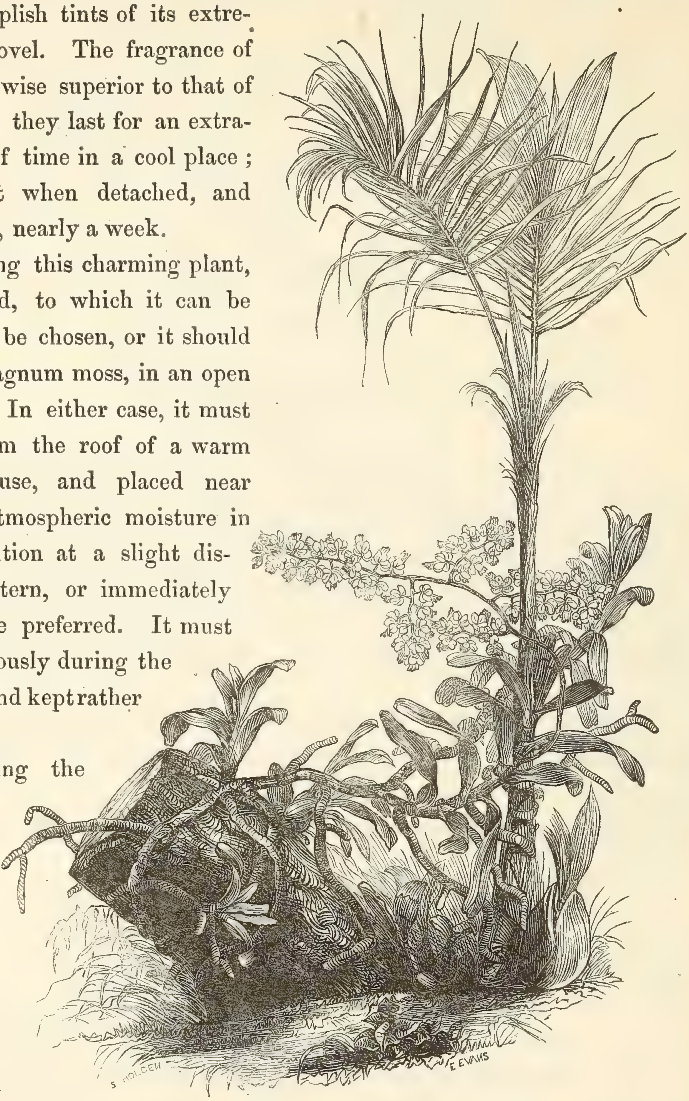
Generic Character.—*Perianth* spreading or closed. *Sepals* lateral, often oblique at the base, having a claw connate with the column. *Labellum* with a claw jointed to the column, saccate or spurred, three lobed; lateral lobes short; middle one cucullate or awl-shaped, or shortly tumid, or partially arched. *Column* reclining on the ovary, short, winged. *Anthers* two-celled. *Pollen-masses* two, furrowed at the back; caudicula broad or filiform; gland peltate, subrotund.

Specific Character.—*Plant* epiphytal, with long tortuous stems. *Leaves* distichous, obliquely obtuse. *Racemes* nodding, many-flowered, very much longer than the leaves, branching occasionally. *Sepals* ovate, slightly acute, folding back at the edges. *Petals* elliptical, also slightly acute, much broader than the sepals, with a light tinge of purple in the centre. *Lip* largest; lateral lobes short, oblong, erect, blunt, streaked with pale purple; middle lobe larger, obsoletely three-lobed, ovate, emarginate, with the edges irregularly jagged, and turned backwards, white at the base, which gradually passes into a rich bright purple; spur curving upwards under the lip, with a greenish horn.

Through the extreme courtesy of C. Horsfall, Esq., of Liverpool, we have been favoured with a beautiful drawing and specimens of this lovely Orchidaceous plant, which was imported by that gentleman some time since from the East Indies, and flowered superbly in his valuable collection during the month of May last.

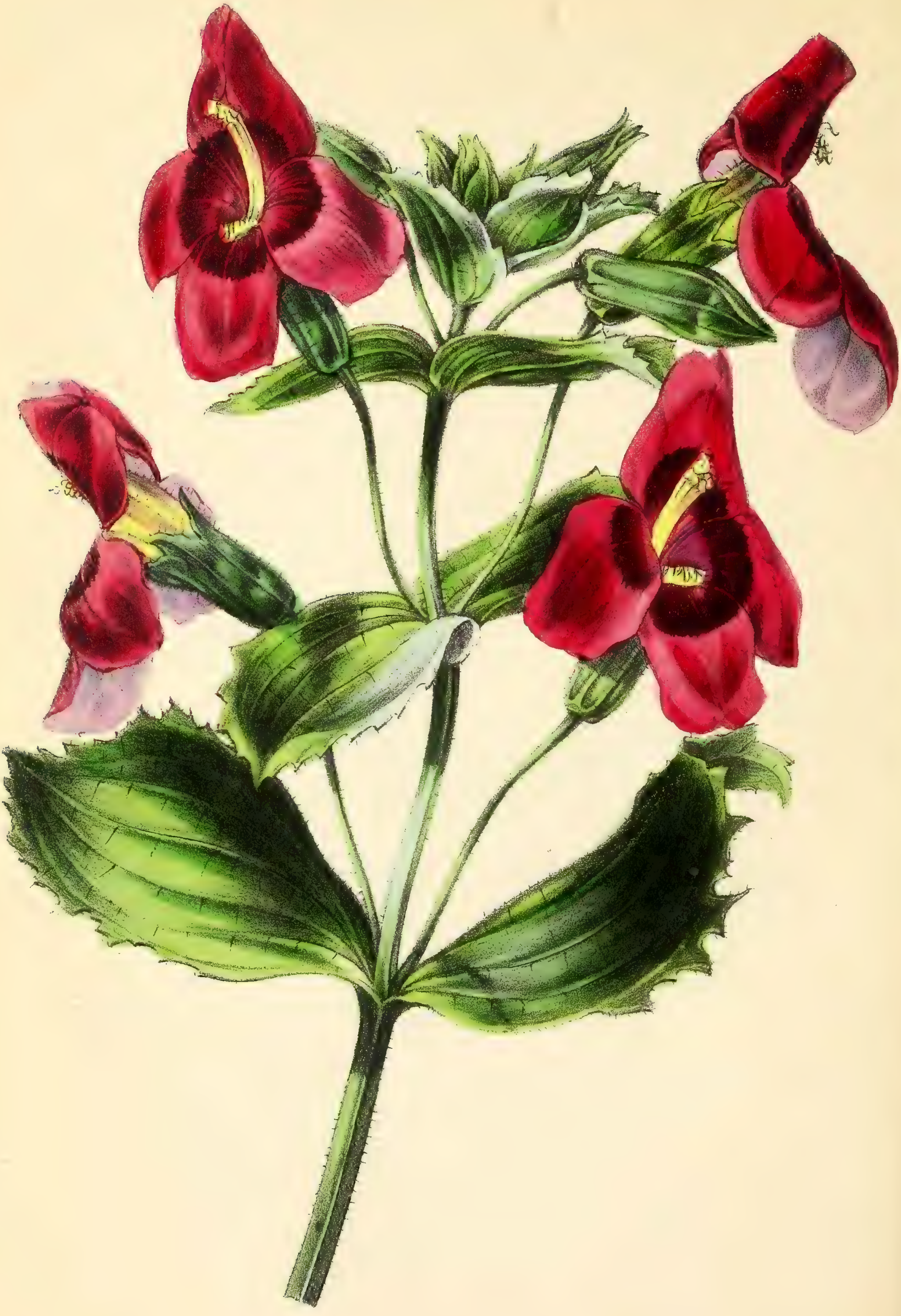
The species is one of the most peculiar and handsome which has yet been introduced. Of vigorous habits, it produces a long and tortuous stem, with luxuriant leaves, on which there are singular patches of a decidedly glaucous nature. The raceme of flowers issues from near the top of the stem, and is from a foot to eighteen inches long, drooping, and bearing several side branches. Of these last, that shown in our coloured figure is one; and being of the correct size, an idea may be formed from it of the dimensions of the entire raceme. In Mr. Horsfall's stove, the plant is growing on a small palm-tree, which adds greatly to its interest. Our woodcut represents the whole specimen.

The sketches at the left hand corner of our plate present tracings of the structure of the flowers. That to the extreme left exhibits a front view of the lip; while the other gives a side glance of its base, including the column and spur. The column may be compared to the head and beak of a bird; and the broadly expansive form of the lip, with its reflexed, undulated, and jagged edges, and the rich purplish tints of its extremity, are quite novel. The fragrance of the flowers is likewise superior to that of *A. odoratum*; and they last for an extraordinary length of time in a cool place; remaining perfect when detached, and kept out of water, nearly a week.



For cultivating this charming plant, a block of wood, to which it can be attached, should be chosen, or it should be planted in sphagnum moss, in an open wooden basket. In either case, it must be suspended from the roof of a warm Orchidaceous house, and placed near the sources of atmospheric moisture in summer. A position at a slight distance from a cistern, or immediately over it, should be preferred. It must be watered assiduously during the summer months, and kept rather dry in winter.

In propagating the plant, the young branches should not be cut off till they have formed roots; and perhaps it will be desirable partially to sever them from the old plant for some time previously to removing them altogether. They ought not to receive much water after their removal, till they begin to grow.



S. Holden del. & lith.

Mimulus Maclainanus.

MÍMULUS MACLAINIÀNUS.

(Mr. Maclain's Monkey-flower.)

Class
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
SCROPHULARIĀCEÆ.

Generic Character.—*Calyx* tubular, five-angled, five-toothed. *Corolla* ringent; upper lip two-lobed; lower one trifid, usually bi-gibbous at the base; segments all flat. *Stamens* four, didynamous, inclosed; cells of anthers diverging or divaricate, at length subconfluent. *Stigma* bilamellate. *Capsule* hardly furrowed, two-valved, with a loculicidal dehiscence; valves entire, with flat margins; dissepiment at length free; placentas adnate. *Don's Gard. and Botany.*

Specific Character.—*Plant* a hybrid, with much of the habit of *M. cardinalis*, but having rather more expansive flowers, which are of a deep crimson hue, with a dark brownish purple centre.

We procured our drawing of this very showy hybrid from Messrs. Rollisson, of Tooting, with whom it flowered profusely last summer. At the present period it is to be met with in most of the London nurseries, and is undoubtedly the handsomest plant of the kind yet produced.

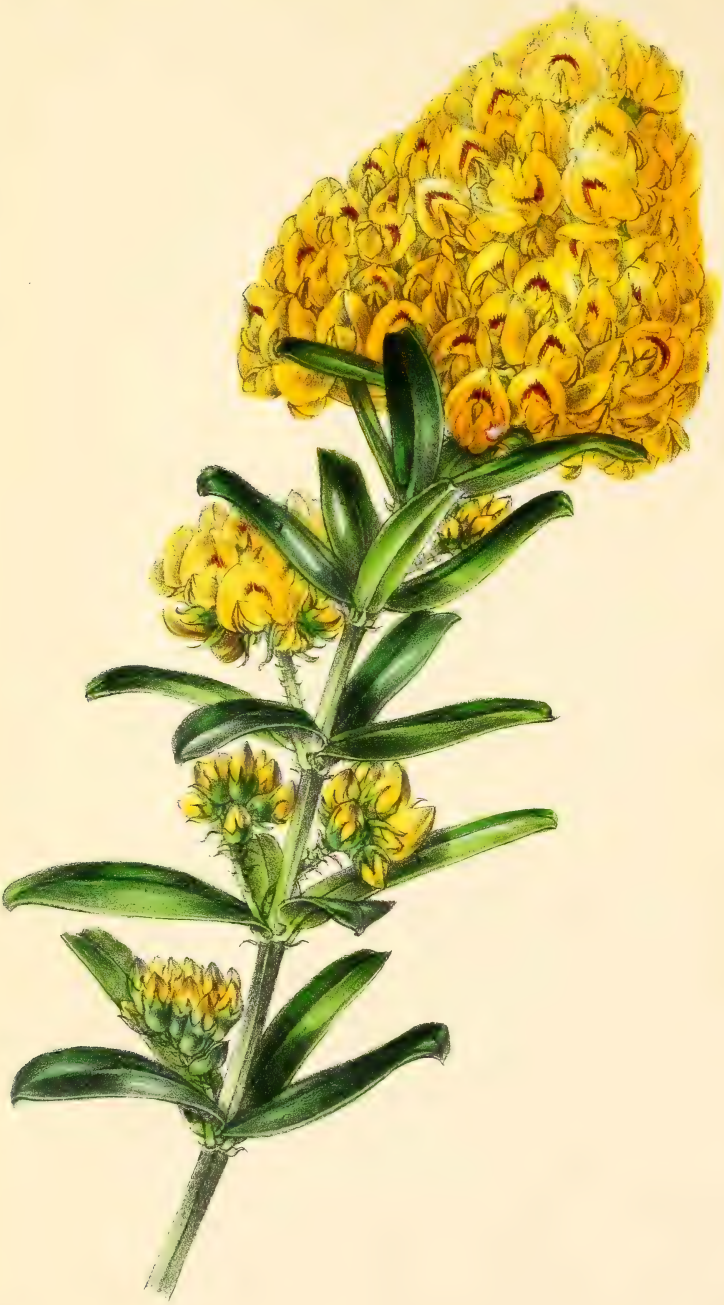
It appears to have been raised by Mr. Maclain, florist, of Harold's Cross, near Dublin, and to have been named after this person by Sir W. J. Hooker. *M. roseus* is stated to be one of the parents; and there can be little question that *M. cardinalis* was the other; for it approaches more nearly to the latter species than to any known kind. Its habit, indeed, is precisely the same; though, perhaps, it is rather more dwarf and compact. The flowers, moreover, are of a similar shape, varying somewhat in the degree of their expansion, and occasionally being broader, flatter, and less reflexed, than they are shown to be in our figure. The drawing, however, accurately represents the ordinary form.

Such is the extreme richness of the colours of the blossoms, that while our colourers have attained it as nearly as possible, nothing can reach the splendid hue of the throat, which has a raised hairy and velvety-looking surface, of an exquisitely superb deep blood-coloured tint.

At Messrs. Henderson's, Pine-apple Place, and in other nurseries, there is a very good hybrid *Mimulus*, apparently of similar origin to the present, but having flowers more like those of *M. roseus*. They are more open than those of *M. Maclainianus*, and of a light rosy crimson hue. It is not nearly so handsome as the plant now figured.

The treatment given to *M. cardinalis* will most probably be suitable to this variety; though it is, perhaps, rather more delicate, and may not be able to endure exposure in the winter. The better plan would probably be to keep it in pots in the greenhouse. It should be grown in a rich loamy soil, placed in a pot of tolerably large size, and watered very liberally. It will be advisable to put the pot always in a pan of water. If planted out in the beds or borders for the summer, the specimens should be plunged rather deeply in the soil, leaving a small basin around their stems, into which water can be freely poured in dry weather. The plant is very easily injured if suffered to want water.

By taking away the offsets, which it produces abundantly, it may be readily multiplied.



S. Holden, del. & Lith.

Oxylobium Pultenæa.

OXYLÒBIUM PULTENÆÈÆ.

(Pultenæa-like Oxylobium).

Class.
DECANDRIA.

Order.
MONOGYNIA.

Natural Order.
LEGUMINOSÆ.

Generic Character.—*Calyx* profoundly five-cleft, somewhat bilabiate. *Carina* compressed, the length of the wings, but about equal in length to the broad vexillum. *Stamens* inserted in the torus, or in the bottom of the calyx. *Style* ascending, crowned by a simple stigma. *Legume* sessile or subsessile, many-seeded, ventricose, ovate, acute. *Don's Gard. and Botany.*

Specific Character.—*Plant* an evergreen shrub. *Leaves* in whorls of three or four, or alternate, linear, slightly obtuse, with folded margins, smooth, but having the middle nerve pubescent. *Flowers* in umbels, pedicellate. *Peduncles* and *pedicels* furnished with small deciduous bracts. *Corolla* orange yellow.

Although not equal to *O. retusum* in showiness, nor yet possessing such ample foliage, this species is one of the most ornamental of the genus; and also ranks very high among the yellow and brown papilionaceous flowers with which our greenhouses are so profusely furnished. The smallness of its leaves is atoned for by their neatness; and when well cultivated, it bears its lively orange blossoms in bunches, from all parts of the stem, crowning it with a large and exceedingly dense cone of inflorescence.

From a fine specimen which we met with last summer at Messrs. Young's, of Epsom, and which was admirably grown, we had the figure which is here given prepared. The plant was from eighteen inches to two feet in height, and had as many as twenty stems or branches, each as good as the one depicted, and flowering as finely.

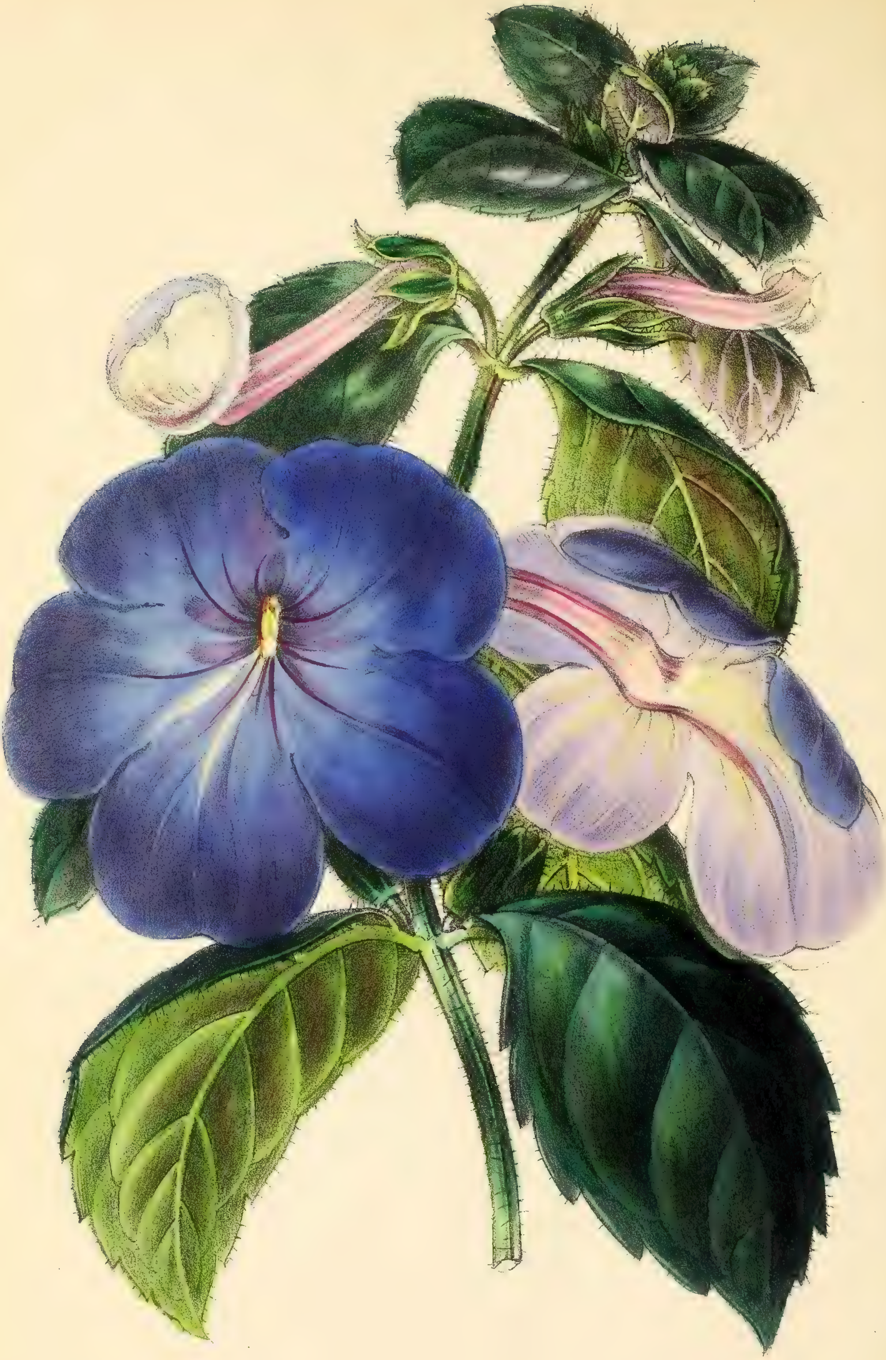
It is by no means a new species, having been brought from New Holland in the year 1824. Cultivators, however, have not given it much attention, and it is far from being common. We believe it has never before been figured; from which circumstance, and from its meritorious character, we have thought that a drawing would be well received.

This is decidedly one of those plants that need a little care in their cultivation, and which will reward the grower for any trouble he may expend upon them. If potted carelessly, placed in a situation where other plants too closely surround it, and not further regarded, it will grow up straggling and unsightly, and apparently deserve only to be discarded. But when it is properly potted in a compost of light loam and heath-mould, mixed with a small quantity of finely-broken stones or bricks, and allowed plenty of light and air, stopping the shoots now and then to render them dwarf and to bring on a state of bushiness; it will take a totally different aspect, and develop yearly those splendid heads of flowers of which a specimen is exhibited in our drawing.

Some care is additionally requisite in watering the plant. Having rather small and scanty foliage, its roots are more exposed to the influence of the sun than those of many similar shrubs. It must therefore be watched lest the soil become hardened in the centre, fall away from the sides of the pot, and thus allow the passage of water round the edges without ever admitting it into the mass. Still, the poverty of its leaves should not be made a pretext for saturating it with fluid, because this very fact renders evaporation less abundant.

Cuttings of the young branches root with tolerable readiness in a sandy soil, under a shaded hand-glass, with the aid of a trifling bottom heat.

Oxylobium is derived from *oxys*, sharp, and *lobos*, a pod, in reference to the sharp point that exists at the extremity of the seed-pods or legumes.



Holden del. & Lith.

Achimenes longiflora.

ACHIMÈNES LONGIFLÒRA.

(Long-flowered Achimenes.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
GESNERÀCEÆ.

Generic Character.—*Calyx* with its tube adnate to the ovary; limb five-parted; lobes lanceolate. *Corolla* tubularly-funnel-shaped, often swollen at the base; limb-five-cleft; lobes sub-equal, sub-rotund. *Stamens* four, didynamous; anthers not cohering. Rudiments of the fifth stamen situated below the base of the corolla. *Nectary* glandulose in a small ring. *Style* slightly thickened towards the stigma, oblique, or with two separate lobes. *Capsule* nearly two-celled, two-valved; placentas parietal, sub-sessile.

Specific Character.—*Plant* an herbaceous perennial. *Root* tuberous. *Stems* inclining to a square figure, nearly simple, hairy. *Leaves* opposite, nearly sessile, ovate, acute, serrated at the margins, hairy, deep green above, light brownish green beneath. *Flowers* solitary, axillary, pedunculate. *Corolla* with a long tube, curving downwards, a little swollen near the top, and expanding into a large, five-lobed, purple limb.

Cultivators having been greatly perplexed by the changes that have been effected in the name of this genus, we copy the following, by Dr. Lindley, from the Botanical Register. "The name now applied to such plants as these was originally given by Dr. Patrick Browne, in his History of Jamaica, to two species, one of which has long been common in our gardens. At a later period, L'Héritier called the latter *Cyrilla*, and under the name of *C. pulchella* it is familiar to all lovers of beautiful plants; but as it was very different from the *Cyrilla* of Linnæus, that name was subsequently cancelled. Then it was that Willdenow proposed the name of *Trevirana*, in which he has been followed by others; and we think it would have been far better if that name had been retained. Now, however, M. De Candolle, following Persoon and Nees von Esenbeck, has restored the name of *Achimenes*, and it would be more inconvenient to resist the innovation than adopt it, since it has taken place in a work so universally employed by systematists as the Prodromus of M. De Candolle. Therefore it is that we agree to the old *Cyrilla pulchella*, otherwise *Trevirana coccinea*, being styled *Achimenes coccinea*, and that we name the present species *Achimenes longiflora*."

This very superb plant was introduced in 1841 by Mr. Hartweg to the gardens of the Horticultural Society. That active collector had met with it in Guatemala. It flowered, as is now well known, for three or four months of last autumn in a stove at the Chiswick establishment, and having produced immense quantities of tubers, was liberally distributed, and is this year to be found in most good collections.

Like many other newly-introduced plants, however, it has been kept in too high a temperature, and its blossoms have not, in consequence, been developed in the perfection they were expected to attain. The proper system of managing it seems to be to start the tubers into growth in a moist stove, or anywhere with a slight bottom heat, and transfer them, through an intermediate house or pit, to a light and airy greenhouse, where they will flourish in the greatest possible health, and bloom splendidly.

Single specimens not having, by themselves, a very striking effect, on account of the fewness of their branches, we perceive that they have been planted thickly in large square boxes at the gardens of the Horticultural Society, where they are now forming the most gorgeous masses of blossom. Placed here and there on a stage in the large conservatory, their appearance is most brilliant and fascinating. As the tubers will be numerous enough for almost every culturist to adopt this practice in the ensuing season, we strongly recommend it to all.

Each of the many tubers which an established plant annually sends forth, will, if abstracted, produce a perfect plant; and the great extent to which this method of increase may be carried, precludes the necessity of propagating the plant by cuttings, which will, notwithstanding, strike with facility.

Any rich loamy soil will suit this species.

GARDENING AS A SCIENCE.

No. VII.—BUDDING.

If the theory of Mr. James Main could be proved, or received as an all but demonstrated fact,—that is, if his view of a *vital membrane* were established,—much of the difficulty which involves the problem of budding would be entirely removed. We will examine this problem somewhat minutely. The "vital membrane" or, as it was at first termed by its originator, the *Indusium*, is described as "that member of the stem whence all new annual growths originate and proceed, and that itself is horizontally engrossed from a very thin layer of gelatinous matter to a body of *wood* and *liber* one eighth of an inch in thickness, more or less, according to the health of the tree."

There is some obscurity in this description, but which we may remove by observing, that during the expansion of the bole of a tree and the progress of new shoots, the bark of the summer will rise and separate from the sap-wood below it with great facility, and discover a moist and juicy surface. This juice, the vestige of that substance called *cambium*, is supposed to be capable of organization, and thus to be the source of the annual layers of sap-wood, and of the *liber* or inner bark. This theory, however, must be defective, because it implies a vitality—a principle of life inherent in itself. The *cambium* is purely an extravasation—a fluid which "disappears every spring after the complete formation of the wood, which then adheres firmly to the bark, but it re-appears whenever the plant is again called into growth, as at midsummer in those species which shoot twice a-year, like roses, peaches," &c.

The latter part of this quotation is not questioned, and the gardener would do well to bear it in mind, as a guide to the theory of budding, which we will endeavour to elucidate; but of the former part, what will those experienced persons say who are accustomed to fell and 'bark' the oak for the use of the tanner? What formation has taken place *in April*, "that of the previous year having been completed many months before the approach of winter?" We are but too apt to assert incautiously.

Mr. Main's theory implies the presence of a membrane always existing—the source and fountain of vitality, "found at all times between the liber and the alburnum, slightly adhering to both, but united to neither; it is a coating (he says) of gelatinous matter, from which the new growths of wood and liber of the next, and all succeeding, years will be produced."

This inherent, vital organization has, we are aware, been stoutly disputed; and we are not prepared to assert, or positively demonstrate, its existence; but the separate and separable vitality of every individual bud *can* be proved, and is continually evinced during the process and results of budding.

An experiment performed by the renowned Du Hamel, whose researches, as has been correctly said, were "an anticipation of almost everything that has been done by the more celebrated modern phytologists," we extract from *Keith's* Physiological Botany, vol. 2. p. 218, as it can be compared with the Theory of Main. Du Hamel, we find, "undertook an inquiry in order to ascertain the origin of the new layer of wood; his first experiment was that of a graft *par l'écusson*, which is done by means of detaching a portion of bark from the trunk of a tree, and supplying its place exactly by means of a portion of bark detached from the trunk of a tree that shall contain a bud. In this way he grafted, (properly speaking—*budded*) the peach on the plum-tree, because the appearance of the wood which they respectively form is so very different, that it could be easily ascertained whether the new layer was produced from the stock or from the graft. Accordingly, at the end of four or five months after the time of grafting, the tree was cut down, and as the season of the flowing of the sap was past, a portion of the trunk including the graft was now boiled, to make it part more easily with its bark; in the stripping of which there was found to be formed, under the graft, a thin plate of the wood of the peach united to the prune *by its sides* but not by its inner surface, although it had been applied to the stock as closely as possible: hence Du Hamel concluded, that the new layer of wood is formed from the bark and not from the wood of the preceding year."

According to Mr. Main the new developments proceed from the Vital Envelope—and in principle, we believe that every known fact establishes the correctness of his opinion. For let us presume that a small shield or piece of very juicy bark, with a bud and its leaf, is taken, either in April or July, from a rose-bush, and inserted into a vigorous and growing shoot of a China or other rose-stock, that a union takes place, and a shoot is produced. The fact being of constant occurrence, may be passed over without reflection; but the attendant phenomena are exceedingly striking. The union of parts must first be effected by the junction of two moist surfaces so pressed together as to expel the interposed air; hence the necessity of a firm, even, and compact bandage. But moist surfaces and steady pressure are not vital actions, neither is an extravasated juice capable of producing organization. It is quite clear by the investigation of cuttings placed in water, that a ring of granular matter is formed between the wood and the bark prior to the production of roots, and as this ring is to all intents perfectly organized, it must inevitably be developed from an organic system endowed with life. A piece of wood destitute of bark or bud will not germinate, and the surface of the alburnum in a stock laid open by the cross-cuts of the budding-knife, is nothing but *wood*. Therefore whenever an inserted bud unites with such a surface, the union can only be effected by the organic granulations developed by the vitality of the bud. The *bud* itself contains the principle of life, but to enable it to grow, that portion of it which is *called the eye* must be retained, otherwise, although the shield of bark may in every part press against the moist alburnum, yet if the eye be gone, a minute cavity will remain just under its centre or pith, and the bud cannot take root in the stock, and therefore must perish.

It is customary to remove the small strip of wood that lies under the detached bud, and thus, unless the operation be adroitly performed, (beginning at the upper part of the bark, above and not below the eye, coaxing, as it were, the wood to slide gradually away from the bark,) the eye will be lost; to avoid the risk of this, many are contented to pare the wood away to the minutest shaving, but as wood cannot unite with wood, there is danger even in this precaution.

To view the operation physiologically, we must consider the phenomena stated by Du Hamel, and those witnessed in the protrusion of granular matter above alluded to, in connexion with the vascular and cellular system of the stock. The following lines from the *Domestic Gardeners' Manual*, p. 560, may be aptly cited. "Budding differs from common grafting, inasmuch as in the latter the buds of the scion lie safely embedded in their own native matrix, and the junction of the edges of the two barks suffices to effect the desired union; but in the former, the bud, in order to produce its developments, must rest upon an appropriate medium; *and if its life have been previously identified with that of the ligneous matter in which it lay embedded*, it cannot continue to live unless it be placed in absolute contiguity with some congenial substance resembling that from which it has been severed. Now such may be found in the divergent layers (the *con*vergent processes of Knight)—*radii medullares*—for their substance appears to be parenchymatous, and they are known to extend to the alburnum and liber."

A very accurate figure of a bud and stock is found side by side with a simple description of the operation, at p. 223 of Lindley's Theory of Horticulture: to these we refer, but beg to extract a few lines, which bear upon the hypothesis now in vogue. "The organization of wood takes place in its exterior, and that of bark on its interior surface, and these are the parts which are applied to each other in the operation of budding; in addition to which the stranger bud finds itself, in its new position, as freely in communication with alimentary matter, or more so, than on its parent branch. *A union takes place on the cellular faces, or horizontal system*, of the stock and bark of the bud, while the latter, as soon as it begins to grow, sends down woody matter or vertical system through the cellular substance." "In all cases a portion of the wood of the bud must be left adhering to it, or the bud will perish; because its most essential part is the young woody matter in its centre, and not the external surface, which is a mere coating of bark."

This extract goes far to corroborate the statement of the previous quotation, from a work written many years since. Both prove two main facts; first, that the bud must be perfect and entire in all its parts; and second, that to secure the adaptation of systems, horizontal and vertical, which is essential to security, the two members, bud and stock, must be alike or nearly related; and thus, that a rose can only take upon a rose-stock, an apple upon an apple, and so forth.

As to the season and the condition of the members, the former is comprised within those periods when the fluids are in motion, as in April, May, and July. A perfect freedom of the bark, both of stock and bud, is essential, and the buds of young luxuriant wood of the same year, inserted within young and active shoots, are always to be preferred, especially for roses; yet it is not denied that in the case of fruit trees, which are rarely budded till July, juicy shoots of the previous spring succeed perfectly.

The *vital principle* of the bud is the prime essential; the exact adaptation of parts is the next grand desideratum; and finally, the mode or order in which the newly-formed matter fixes itself to the alburnum, all prove that those granulations which precede the formation of cellular and fibrous structures are only *developments* of matter already pre-existing. Formerly, it was considered important to bring the upper edge of the shield into exact contact with that of the cross-cut in the stock. Now, however, it is proved that the bud and its bark may be thrust deeply within the slit, and be retained more secure when so situated, because granular matter oozes from every part of the bark, and radiates over the moist alburnum; while the cellular central system of the bud unites itself to that of the stock, through the channels of the horizontal convergent processes.

Those who argue for the operation of the *descending* sap, assert that wounds of the bark heal at the upper part; but let the observant inquirer take notice of the way in which any abrasion of bark—as in the case of an amputated bough—is healed, and he will perceive that the fresh substance which covers the wound comes gradually rolling on from every part of the bark, till it meet and close at the centre.

ON THE ARRANGEMENT OF PLANTS IN GROUPS.

A MORE comprehensive subject could hardly be selected than that which forms the heading of this article. Plantations of trees and shrubs, scattered clusters on lawns, beds and patches of flowers, the disposition of plants in houses, and their arrangement when removed to the open air for the summer, are all included in the above title. That we shall be able to enter freely into each of these topics, we do not anticipate. All we can here hope to effect, is to offer a few general remarks on the most important features.

In planting any sort of objects in masses, a very great degree of judgment, wrought into sound taste, is requisite. Any one may collect plants together in heaps, and so dispose them as to approach as nearly to the desired appearance as if their seeds had been scattered promiscuously by birds; but the true principles of ornamental planting demand a long and patient study ere the least proficiency can be attained.

Extensive plantations are divisible into those formed on a level tract of ground, and such as cover the tops or slopes of hills; those which are to be viewed from a distance, and such as are near the common centre of observation; with those which are above or below the spectator, and such as have to be traversed in order to be seen.

Woods planted on a plain ought to be composed of the utmost possible diversity of materials. Irregularity or undulation of surface, which is always pleasing to the eye, not being here provided for by Nature, must be obtained by art. Hence, trees of various known heights, of different rates of growth, and having a great dissimilarity of foliage, should be employed in such situations.

For the slopes or summits of hills, again, it is of much less consequence that a diversity of trees should be chosen. Indeed, a bank of Beeches or Oaks, if the slope be not very precipitous, or of Larches or Pines, where it is peculiarly steep, with a knoll of either of these kinds, or of Firs, produces a striking richness or massiveness of effect, and is often preferable to a mixture of trees. But where the top of the hill presents a continuous line without breaks or interruptions, it must not be planted entirely with one sort of tree, unless the specimens differ widely in age and size; for nothing is more disagreeable than a long, flat, formal line standing up against the sky.

Plantations that are to be seen from a considerable distance, ought to be very differently composed to those nearer the observer. Greatness of effect is to be sought, rather than variety. And as they will almost necessarily be upon hills, immense groups of one species of tree, or of trees that assimilate in general character, are better than the ordinary aggregation. We must repeat, however, that if the outline be at all inclining to a level, it is to be changed by leaving occasional blanks, or by the introduction of taller trees on the highest parts. We were lately much gratified by a peculiarity in the views from a celebrated ducal residence, caused by judicious planting. Two or three ranges of hills rise gradually higher and higher as they near the horizon, and the farthest, which is of course the most elevated, is clothed with the sombre foliage of the Fir and Pine. Not only are these trees thus seen in their appropriate situation, as they naturally abound in high localities and remote from the dwellings of men, but, by their dark and gloomy aspect, give an amazing amount of distinctness to the hills they cover, and render what, from its distance, would be very imperfectly perceptible, a most conspicuous feature in the landscape. By this simple practice, besides showing out the hills in the foreground, and making a singularly ornamental component of the scene, it may be truly said, that, in appearance, an immense district is added to the domain.

For woods that are more immediately within the range of vision, an additional variety of trees is necessary. Where the forms of the trees and their foliage can be readily discerned, it is little short of indispensable that they vary materially. If they be in a nearly level valley, there is a particular necessity for this, since nowhere can a monotonous surface be less tolerated. Evergreen trees are scarcely adapted for such localities; yet, if they be planted sparingly, and at intervals, they will increase the diversity of form and colour in the summer, and answer the same end even more effectually during winter. One great object in preparing a wood of this description, should be by having specimens, or masses composed of several sorts, far enough apart to break up the whole into individual heads, of greater or less dimensions. By such a plan, and a proper amalgamation of the different varieties, a perfectly level piece of land may be made to present an astonishing irregularity of surface. If, again, the home woods be upon hills or their faces, beyond seeking to give them a motley-hued aspect in their verdurous state, it will be well to plant them so, that in autumn, with the change of the leaf, there shall be every attainable variety of tint. Thus, some trees shed their foliage sooner than others, and some assume a darker shade of yellow or red, while evergreens seem to have their colour deepened by the contrast of the decaying vegetation around them. It may savour of fancifulness; yet we cannot help asserting, that as much depends on the arrangement of trees, with respect to their colour both in summer and autumn, as on the grouping of flowers. The tones of the one, it is true, are not so decided or arresting as those of the other; but they are quite as impressive to an observant mind. And we think that there is scarcely a finer sight in Nature, than a hill-side, arrayed in the numberless tints which autumn imparts to trees, when these are harmoniously blended.

Assemblages of trees that are situated above the level on which the spectator stands, whether near or remote from his gaze, have to be considered chiefly in their superficial outline, or the manner in which they tower into the sky. Whatever may be the elevation of an eminence, it becomes tame and spiritless if the plantations upon it exhibit one unvarying straightness of surface. And while it is not practicable to give undulation on a large scale to the earth itself where Nature has denied it, advantage may be taken of the slightest depressions to leave them uncovered, just ensuring that the trees below them shall prevent their bareness from being seen; while similarly trfliing elevations may be planted with some of the taller-growing trees. In this way, a general undulation may be occasioned; and the minuter degrees of diversity necessary can be caused by using trees of different altitudes and shapes, as well as by omitting one or two trees here and there on the extreme summit.

For hills in the distance that have to be looked up at, the spiry tops of Larches and Firs constitute an admirable clothing, particularly when only the end of the range, or a solitary eminence or mound, is seen from the mansion. As before hinted, Pines have a majestic effect when bounding the prospect, and many miles from the beholder. On the hills around home, common trees may be planted. Especial care is, however, needful to guard against the uppermost ones being seen through, except at the tops. To avoid this, they can easily be fronted and backed by other trees. The objection to seeing their stems is, that besides being in themselves unsightly when thrown out against the sky, they do away with that rich, dense, and massy appearance which is so much admired in a wood, particularly in one on an eminence. It should therefore be provided that not only their boles be concealed, but that a thick mass of branches and foliage, impervious to the eye, should descend directly from their summits down to the slope they surmount. In wild, savage scenery, where the hills are steep, rugged, and faced with projecting rocks which preclude the plantation of more than a few trees, a solitary Scotch Pine at or near the apex, or a group by no means well connected or supported, will, by throwing abroad their tortuous and picturesque arms, add a characteristic feature to the scene. But this is merely an exception that helps to establish the rule. Where knolls or mounds exist in parks, or in the outlying parts of the estate that are not far from the house, no tree will form a better termination to them than the Beech. The drooping character which its branches take in old age, and the readiness with which a number of specimens combine to make up a compact and united cone, give it a remarkable aptitude for occupying such a position.

In looking down on a plantation, which must, from that circumstance, be presumed to lie in a valley, the principal desideratum is diversity. To destroy its flatness by putting high trees on the rising portions, and leaving unplanted, or covering only with smaller trees, the lower parts, is but one of the modes of realizing that end. Small glades of turf, occasionally made visible; specimens of trees altogether detached; a judicious mingling of spiry and round-headed, evergreen and deciduous, drooping and fastigiate trees; with a due regard to the colour as well as shape and size of their foliage, will all aid in relieving the uniformity that would otherwise be experienced.

A yet different arrangement of plantations is called for when they have to be viewed from drives or roads which pass through them. Here, the chief effect is required by the sides of those roads. The most obvious fault in such cases, is that which we can aptly describe by saying that the idea is predominant, at every step, that the openings were cut through the woods in order to make a road, and not that the road was a part of the original design in planting. Nothing is apparent but a forest of trunks below, and a continuous roof of foliage above.

Now, we do not affirm that something of this sort might not give the interest of novelty to a very long drive;—all that we exclaim against is its perpetual occurrence. Surely, in the neighbourhood of a drive, the trees should be planted thinly enough to show their individual characters, or that of their species; and some serviceable hints might be derived from natural forests in this respect. Where openings do present themselves in these, the trees at the sides of them generally spread their branches nearly down to the ground, affording mere casual glimpses into their more secluded depths. We conceive, then, that drives through plantations should be flanked with more thinly-planted trees, and isolated specimens; that recesses and more lengthened openings ought to occur with greater frequency; that, in no case, should the line of trees run parallel, for any distance, with that of the road, or with the line on the opposite side; that pieces of wild thicket and common bushes or shrubs of a deciduous kind, should stand at a few of the more salient points of the plantation, or in some of the retiring glades, or form an impervious slope from the trees in places where it is desirable to exclude the eye from what is visible behind; that evergreen shrubs be similarly employed for the same purpose where Pines and Firs prevail; and that shrubs of all sorts be more freely planted as an undergrowth, with Rhododendrons, and such like flowering plants, by the sides of the road. It may be that these suggestions have already been partially carried into effect in some estates. But their adoption is not, on this account, to be the less desired in others; and we urge them, imperfect as they are, on all whom they may concern.

Besides the assemblage of trees in groups called plantations or woods, on which we cannot now longer dwell, there is that system of planting in lines, termed avenues. These are mostly confined to pleasure-grounds and parks. An avenue, it may be remarked, should never be placed on the top of a hill or eminence, since the uniformity in the height of the trees composing it would have a very disagreeable effect from the lower ground around it. Nor should it descend a hill, and have its termination in a valley, for this will create the idea of going down to a residence, even though it should not lead to a building; and to pass down a hill towards a house is always repugnant to taste. Avenues, again, are not compatible with lines that are variously or abruptly curved; and ought, therefore, to be invariably straight, or to depart very slightly from a right line. Curves and windings nullify their simplicity and grandeur; and the mind cannot endure to be shut up between even verdurous walls, without being able to see to what they lead.

The dignity and magnificence embodied in the very nature of an avenue, demand that it should end in a mansion or other architectural object of corresponding greatness. If the formation of "walks that lead to nothing" be justly a subject of ridicule, how much more absurd must their want of an object become when having stately rows of trees on either side! The mind acquiesces in its confinement between lines of trees, in the assurance that they will conduct to something which will reward its patience. Their existence is entirely calculated to beget and foster such a notion; and where they do not lead to a mansion, they ought, at least, to bring the visitor to some highly-enriched obelisk, or pillar, or temple, or to take him to the top of a hill from which some glorious or sublime prospect may be obtained. Without they do one or other of these things, they must be pronounced abortions, and proportionately reprehended.

We are acquainted with avenues which begin and terminate in open parts of pleasure-grounds and parks, or are similarly objectless in public roads; and we can call to mind others, too, which form the approach to houses of the most undignified character, which are mere masses of brick, without the least architectural proportions or style. Some, moreover, are finished a few yards to the right or left of a tolerably respectable residence; and appear to have belonged to the more tasteful proprietors of a former mansion. All these are nearly alike faulty; and unless an avenue proceeds at once to the central portico of a house, or to the principal part of any other edifice, with the position of which it is made to accord, it had much better be broken up or dispensed with.

In addition to avenues, which are not everywhere adapted to the style of a place, there are those smaller and more compact groups of trees, which are dispersed throughout parks and pleasure-grounds, and which are indispensable to ornamental effect. The masses called clumps in parks are usually little circular plantations, surrounded, at first, with a temporary fence. Where only from twelve to sixteen trees are intended to be reared in this group, we should prefer the protection of each individually, by any of the most approved plans; for all young plantations enclosed by fences have a most artificial and displeasing aspect.

If the groups are to be large, they must necessarily be formed of a variety of trees, especially when they constitute the horizon from any important part of the grounds. But where they are limited to five or seven trees, a handsomer mass will be produced by having them all of one or two sorts. The most elegant and symmetrical groups we have ever seen were of three trees, planted so as to give the three corners of an equilateral triangle. The branches intermingle with each other, and the whole displays a pyramid or cone that looks like a gigantic and widely-spreading single tree. Limes, Elms, Chesnuts, Oaks, and all the round-headed tribe, are peculiarly well fitted for planting thus; and, with a few masses of larger size, and a due proportion of solitary specimens, a park, or the space between the pleasure-garden and the woods, might in this manner be most appropriately furnished.

We must defer the publication of the rest of this paper till the appearance of the next Number.

CULTURE OF CHOROZEMA CORDATUM.

It must often have been observed, even by those who take the most superficial views of things, that many plants which, when improperly treated or neglected, would be deemed unworthy of culture, become invested, by judicious management, with an interest and a beauty which cause all who see them to desire their possession. But for want of investigating and following the treatment they have received, their procural too frequently leads to disappointment.

Very commonly, too, does it occur that persons who have been accustomed to witness certain species only in the ordinary and inferior state that is produced by careless and inappropriate management, or rather by an absence of all management whatsoever, pronounce well-cultivated specimens to be superior varieties. Similar mistakes have likewise been made in regard to some of the figures which we publish in our Magazine; and we have repeatedly been taunted with flattering or exaggerating the subjects of our drawings, simply because we are careful to have them taken from plants in a healthy and highly-cultivated condition.

We are fully aware that there is nothing new in these statements. The effects of culture have been many times described. There are, however, individuals who, while they perceive them in particular instances, have no acquaintance with them in others; and who notice them in not a few without being able to account for them, or to understand the processes by which they are brought about.

Chorozema cordatum is, we think, an example of both these cases. Ordinarily met with either in a loose, straggling, and most unattractive condition, or trained to a tall formal trellis, and destitute of leafy and flowering branches, except at the summit, many persons have no conception that it is capable of being rendered one of the most ornamental of greenhouse plants. And those who have been made familiar with its susceptibility of culture, seldom inquire into the mode of improving it, or, so doing, ascertain the precise routine by which it is so surprisingly ameliorated. The general impression on having a finely-grown specimen presented to view, is, that it is another and a better variety; and though there is, in reality, a kind with larger flowers existing in collections, the old original species is quite as easily influenced by proper means, and very nearly as handsome.

Our assumption, then, derived from a tolerably wide range of observation, and, indeed, based on numerous facts that have come beneath our actual inspection, is, that this species, instead of being left in a rambling and almost leafless state, with a profusion of nothing but bare stems and branches, and merely a few flowers scattered over the points of its uppermost shoots, assuming altogether an inelegant and positively disagreeable aspect, may be made dwarf, exceedingly bushy, and abundantly productive of both foliage and blossoms of a decidedly beautiful description; thus realizing a degree of gracefulness, neatness, and showiness, which enables it to vie with most of the inhabitants of our greenhouses, and to excel a large proportion of them. We have here, therefore, to relate the manner in which that end, so greatly to be wished for, can be effected. To do this efficiently, we shall hurriedly trace the progress of the plant, from the time of its propagation till it arrives at its richest perfection.

We need hardly premise that the species is multiplied by cuttings. These are taken from the extremities of the terminal or lateral shoots, which, having a general tendency to flower, should invariably have their points removed. A sharp knife is more suitable for the operation than the hand, the employment of the thumb and finger of which is apt to crush the tender tissue, and make it more difficult to heal. This stopping of the shoots is one of the most important processes in the plant's culture, and should be begun thus early because on it will depend the future beauty of the specimen. Its object is to induce the plant to branch abundantly.

When, from the indications of growth in the cuttings, they are found to have protruded an adequate number of roots, they ought to be potted into the smallest sized pots, one in each; and, supposing the lateral shoots they have formed to be two or three inches in length, these should again be stopped at the time of potting. By checking them at that period, their roots will the more readily be enabled to establish themselves in their new position, having less demand on their energies from above.

As soon as the palpable advancement of the plants shows that their roots have reached the sides of the first pots, they must be shifted into others a size larger. Never should the plants be allowed to form a matted mass of roots around the inside of the pot before they are shifted; because they cannot, in this case, be so healthy as when they have a sufficient medium in which to extend themselves, and it is always longer ere they can strike out into the new soil provided for them in re-potting.

In respect to the compost proper for our present subject, a light and very sandy loam, mixed with about a third more of sandy and fibrous heath-mould, will be fittest for the plants while in a very young state. At the second potting, however, a rather more nutritive loam, with less of sand in it, and a diminished quantity of heath-soil, will be preferable. And, as the specimen increases in size, the earth may gradually be changed to a rich loam, with a very small proportion of heath-soil, and the substitution of little pieces of broken sand-stone, or similar materials, for the sand existing in the compost previously mentioned. We do not mean, by rich loam, that any manure should be added to it, but that it should be of a tolerably nutrimental order, and newly derived from a meadow or pasture. It ought not to be divested of its fibrous constituents, and, together with the heath-mould, simply be reduced with a spade, not sifted.

With the growth of the specimens, they should be shifted as above directed, using a pot one size larger at every removal, and transferring them as often as their roots just reach the edges of the pot. The stopping of the shoots must likewise be continued, for they will inevitably acquire a lax and spreading character if not duly reduced. When it can be prudently done at the time the plant is potted, that is, unquestionably, a better period, for a reason already given. The appearances that determine its necessity are the growth of the branches to the length of three or four inches, and, more particularly, their disproportionate weakness, or the distance between the leaves.

Supposing the specimen to be settled in its second pot, it is time that we explained what form it is required to take. If an extremely broad plant, not more than a foot high, be wished for, the points of the branches must be cut off more frequently than we have suggested, and before they have grown so long. In fact, it is almost necessary to stop them, for a while, at every fresh joint, or, at least, at every second joint, when they have developed three. The lower shoots, moreover, can be pegged down to within an inch of the soil, and most of the others tied, at first, in a horizontal direction. An increased power of producing laterals will thus be imparted, and the requisite breadth and dwarfness will simultaneously be obtained. After the second year, the laterals can be left to perfect themselves, when they will all flower most vigorously; and on the fading of the blossoms, they can be stopped as before, to prepare a new series of similar flowering shoots in the following season. In the last instance, the pruning should be done in autumn or winter, and not while the plant is growing.

But where a handsome plant, three, four, or five feet in height, is sought after, it must be procured by a different course. A bush, of the usual shrubby nature, might probably be gained by a patient continuance of the culture just recommended; yet it would require several years of preparation, and very elegant plants may be reared sooner by the plan we are about to propound. Instead of allowing the early branches to spread outwards in the ordinary way, they should be intertwined with each other into a flat surface, three or more feet wide; still conducting the stopping process, as the branches get four or five inches in length, (effecting it at two inches while the specimen is but small,) and proceeding to interlace these closely, and to remove the points of their superfluous laterals, as they are formed, a dense specimen will be created in two or three years, of the required height, and having shoots on both sides in great profusion, as well as at the summit. By stopping all these again, once or twice, the specimen will be rendered about half as thick as it is wide, and the laterals may then be permitted to extend themselves thoroughly, and to flower. The whole will then constitute a mass of gracefully waving branches, each studded with one or more racemes of flowers; and this condition may be long maintained by the adoption of the practice spoken of in reference to the preservation of the dwarf specimen.

Three or four stakes of a moderately strong kind, and placed about three inches apart from each other across the centre of the pot, parallel with the expansion of the branches, will be amply sufficient to support the specimen, and no trellis will be needed. The formality which might be thought to result from training, originally, to a flat surface, will be completely done away by the laterals that are left to grow out on either side.

By either of the preceding methods, specimens of the most elegant and ornamental kind may be easily prepared; and the peculiar simplicity of the plan will, we are sure, prove a source of recommendation, rather than objection.

FLORICULTURAL NOTICES.

NEW AND BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR JULY.

Arundi'na de'nsa. "Of the fine Oriental genus *Arundina* we now possess two species in gardens, this and *A. bambusifolia*." The present plant is a native of Sincapore, from whence it was sent to Messrs. Loddiges by Mr. Cuming. "It differs from *A. bambusifolia* in its leaves being nearly equal, and not gradually diminishing into small sheaths as they approach the flowers, and in the flowers being very closely, but loosely, arranged; and in the small size of the middle lobe of the lip, which is almost blended with the large lateral lobes. There is a difference too in the crested veins of the lip, which are all three crisped in *A. densa*, while the middle one is straight and even in *A. bambusifolia*." The plant has erect stems, something like *Phaius* or *Pesomeria*, but more slender. Its flowers are clustered at the top of the stems, and have much of the form, colour, and beauty of those of some smaller Cattleyas. They are very handsome, and "emit a most agreeable perfume." It should be grown in an orchidaceous house, in turfy heath-mould, and be particularly well watered. *Bot. Reg.* 38.

EPIDE'NDRUM RANI'FERUM. "Although a good deal like *E. nutans*, this species is really very distinct, and indeed far handsomer; in consequence of the rich purplish brown spots with which the sepals and petals are profusely decorated." The reference to *E. nutans* will give a good idea of its habit, as well as of the form of the flowers. "Like so many of the order, this species varies a good deal in the amount of toothing observable in its lip. In the original specimens the divisions were perfectly entire; in the accompanying drawing they are represented as if they were all toothed. In a cultivated plant, now before me," adds Dr. Lindley, "they are both the one and the other." G. Barker, Esq., of Birmingham, and other gentlemen, introduced the plant from Mexico; but it is not confined to that country, as Mr. Schomburgk "found it in British Guiana, with a branched raceme." *Bot. Reg.* 42.

GESNE'RA LONGIFO'LIA. "This is a remarkable species, with more the habit of *G. allagophylla* than of such species as *G. faucialis*, *bulbosa*, and the others commonly cultivated. It grows about two feet high, and is closely covered by a dense grey down. The leaves grow in whorls of three, and are sometimes eight or nine inches long, of a lanceolate form, thick, petiolate, serrated towards the upper end, and by no means wrinkled. The flowers are produced in long close cylindrical terminal whorled racemes, three or four growing together from the axils of short floral leaves. The corollas are brick red, about an inch long, somewhat cylindrical, but inflated above the middle with a short fine-toothed spreading limb, whose divisions are all of the same size and form. There is no trace of the obliquity which occurs in *G. bulbosa* and its allies.' Mr. Hartweg introduced it from Guatemala to the Horticultural Society, in whose garden it is found to be easily cultivated with the ordinary treatment. *Bot. Reg.* 40.

HYDROTÆ'NIA MELEA'GRIS. The extraordinary blossoms of this plant are its chief recommendation. "Its appearance is by no means attractive; but the interior of the flower, when carefully examined, will be found to exhibit beauties of no common kind. The curious watery band, which glitters as if covered with dew, or as if constructed out of broken rock crystal, is one of the most curious objects known. The stigmata too are extremely remarkable; each divides into two arms, which are rolled up as if forming a gutter, with a dense mass of bright papillæ at the end, and a single tooth on the inner edge: between the arms stands a short mucro, which is free from glands, and forms a minute horn." The colours of the flowers are, moreover, exceedingly varied and pretty; purple and lilac of different shades, yellow, white, bluish, and blush, being all beautifully associated and blended. It is a greenhouse bulb, cultivated like Tigridia, and blooming in the summer. *Bot. Reg.* 39.

PHILADE'LPHUS MEXICA'NUS. A very peculiar new species, which "forms a small bush, with weak branches, and has the merit of being an excellent plant for forcing." "It is cultivated in Jalapa, and grows wild in the hedges there; also at Oaxaca and the city of Mexico, according to Schlechtendahl. Hartweg found it at the Hacienda del Carmen," and sent it to the Horticultural Society. In gardens it is "the smallest of all the species yet known, not growing more than two feet high. It is sub-evergreen, and rather tender, being sometimes killed to the ground by the severity of winter. It flowers freely about the end of June, if planted in the ordinary garden soil, and strikes freely from cuttings of the half-ripened shoots." The flowers are large, solitary, and not unlike a small single rose. *Bot. Reg.* 38.

PLUMIE'RIA ACUMINA'TA. "Those who have a good stove and sufficient height should not fail to cultivate this beautiful tropical-looking plant. The foliage is large and handsome; the flowers copious, each three inches in diameter, and so deliciously fragrant that a very large house is scented throughout by a very few of the expanded flowers, and this scent is retained by the corolla for some time after it has fallen from the tree. These blossoms continue expanding in succession upon the same cyme for a period of many weeks." "It flowers throughout the summer months in the stove of the Royal Botanic Garden, Kew, and till late in autumn. During the winter months even the leaves are deciduous, and the bare branches are then, it must be acknowledged, very unsightly. It loves heat, and with us the pot is always plunged in tan." The species is from the East Indies. Its flowers are yellowish white, faintly streaked on the outside with a darker hue. *Bot. Mag.* 3952.

Sola`num Balbi´sii ; *var.* bipinna`ta. Covered with coarse prickles, of a gross habit, and having flowers little superior to those of the common potato ; neither this species nor its variety is particularly interesting. " Our present variety has extremely pale flowers, but the leaves very much divided, so as instead of being simply pinnatifid, they are truly bipinnate." It has large upright racemes of light lilac blossoms, and will grow readily either in a stove or a warm greenhouse. Mr. Tweedie sent seeds of it from Buenos Ayres. *Bot. Mag.* 3954.

Styli´dium pilo`sum. A neat and distinct species, raised from Swan River seeds. " It has the largest flowers of any yet introduced, and when in good health forms rather a handsome appearance. It is sometimes met with under the name of *S. Dicksonii.*" The blossoms appear to be white, with the petals much undulated and toothed. It is a greenhouse perennial, " requiring a soil composed of sandy peat, mixed with a small portion of loam. It should be kept in small pots, and treated as a sub-aquatic during the growing season in summer ; but must be kept rather dry during the winter, and in a cool part of the greenhouse, where there is plenty of light and air. It is easily increased from seeds." *Bot. Reg.* 41.

Zi`chya glabra`ta. A very elegant and attractive species, limited in its growth, and, indeed, with a tendency to become prostrate. " The seeds have been sent from the Swan River settlement to the Glasgow Botanic Garden, where the plant produced its lively red blossoms in the early part of summer. It succeeds well in a common greenhouse, but the stems require support." It was, however, obtained from New Holland by Mr. Knight, of Chelsea, some years back. *Bot. Mag.* 3956.

NEW OR INTERESTING PLANTS IN FLOWER AT THE PRINCIPAL SUBURBAN NURSERIES.

Achime`nes longiflo`ra. This splendid new species is flowering in many nurseries and gardens ; but, being for the most part badly treated, it is not seen in the perfection which many may have thought it would attain. Cultivators, anxious to bring it early into flower, have kept it in a warm stove ; whereas, it appears to thrive best in a greenhouse during the warm months, and in a position, too, where it can receive plenty of air. Those who have it in a stove, however, should not abruptly remove it from thence. The change must be made as gradually as possible.

Achime`nes ro`sea. Mr. Low, of Clapton, is blooming this beautiful plant, and the flowers seem likely to be richer than they were last year on the original specimen. No doubt, it will be like *A. longiflora* in its preference of a cooler house than the stove ; at least, after it has been fairly started in the spring. A greater healthiness of foliage, and closeness of habit, with finer flowers, will be the result of such treatment.

Amary´llis japo´nica. A curious species, introduced by Dr. Siebold from Japan, and probably hardy, or nearly so. It has blossomed in a greenhouse at Messrs. Young's, Epsom. The flower-stem is not more than an inch or two in height, and the flowers are of a dark yellow or pale-orange colour, with singularly curled segments. If hardy, it will be a very interesting plant for beds or borders.

Antirrhi`num ma`jus flo`re ple`no. In the nursery of Messrs. Young, Epsom, there is a particularly handsome variety of the old Snapdragon at present in bloom. It has large double flowers, of an intensely rich crimson hue ; and as these are borne very profusely, the plant has a very showy appearance.

Blandfo´rdia no´bilis. The peculiar elegance of this species renders it eminently worthy of cultivation as a greenhouse plant. Messrs. Loddiges are flowering it abundantly. The leaves are long, narrow, deeply channelled, and sheathing each other and the stem at the base. The flower-stalk is strong, erect, about a foot high, with numerous large drooping orange and yellow blossoms ranged round its summit. The pleasing arrangement as well as showiness of the blossoms, are very conspicuous features.

Cyrtoce'ras refle'xa. At first called *Hoya coriacea,* but since altered to the above. It is blossoming freely in one of Messrs. Loddiges' stoves, and by the attractive form of its pretty whitish pendulous flowers, combined with the size, beauty, and healthiness of its leaves, has a very striking effect.

Dendro'bium adu'ncum. A beautiful new species, which is flowering well with Messrs. Loddiges. It has long and rather slender upright stems ; which, however, when old, and bearing fresh shoots and flowers, acquire a partially drooping character. The blossoms are produced in short racemes from the older stems. They are about three-quarters of an inch across, white, and so exceedingly transparent after being expanded some time, that they have quite a gelatinous appearance. The column is tipped with reddish purple, which occasions a pleasing variation.

Fu'chsia La'neii. Messrs. Lane, of Berkhamstead, Herts, exhibited a hybrid *Fuchsia* at the last Chiswick show, and obtained for it a silver Banksian medal. They have since sent us specimens. The habit is dwarf and close ; the leaves ample, with the elegance of the older species and none of the coarseness of the more modern kinds ; and the flowers are somewhat of the shape of the old *globosa*, but more expansive, and singularly large. Their sepals are bright crimson, and the petals darker, or of a light purplish hue. It is one of the best hybrids we have seen.

Gailla'rdia corona'ta. This is a very handsome border plant, with showy reddish brown flowers, the edges of which have an orange tint. It is blooming both in the greenhouse and the open ground at Messrs. Youngs', Epsom ; who have also a superior variety of *C. bicolor*, in which the flowers are very considerably larger than in the species.

Gentia'na septe'mfida ; *var.* cauca'sica. The beautiful *G. septemfida* was figured and highly recommended in our last volume. It is a most ornamental species, and the present variety is distinguishable from it by its greater dwarfness, by the far closer arrangement of its leaves, and its slightly deeper blue flowers. It is a very lovely little object, at this time, in the nursery of Messrs. Young, Epsom.

Loa'sa Herbe'rtii. A valuable hybrid, between *L. lateritia* and *L. Pentlandica.* It has the climbing habit of the former, but considerably modified, and the leaves and flowers are much finer than those of *L. lateritia.* Messrs. Henderson are flowering it in a greenhouse, and it is evidently superior to both its parents.

Loa'sa volu'bilis. Introduced to this country many years ago, and subsequently lost. It has now again been obtained by Mr. Low, of Clapton, from Chili. The leaves are irregularly divided, nearly smooth, and stingless, while the flowers are of a lively yellow, and exceedingly pretty. It is a climbing or twining plant, and deserves to be cultivated in every garden.

OPERATIONS FOR AUGUST.

Towards the decline of the present month, when the newly-added wood of greenhouse shrubs is tolerably hardened, it will be advisable to expose the more robust of them to the open air for a month or six weeks, in order still further to ripen their developments, and prepare them for flowering finely in the following spring. We have lately put forth an article in which the injudiciousness of turning them out at an earlier period is placed in a clear light, and the time will soon arrive which we recommended in preference to that usually chosen for effecting that exposure.

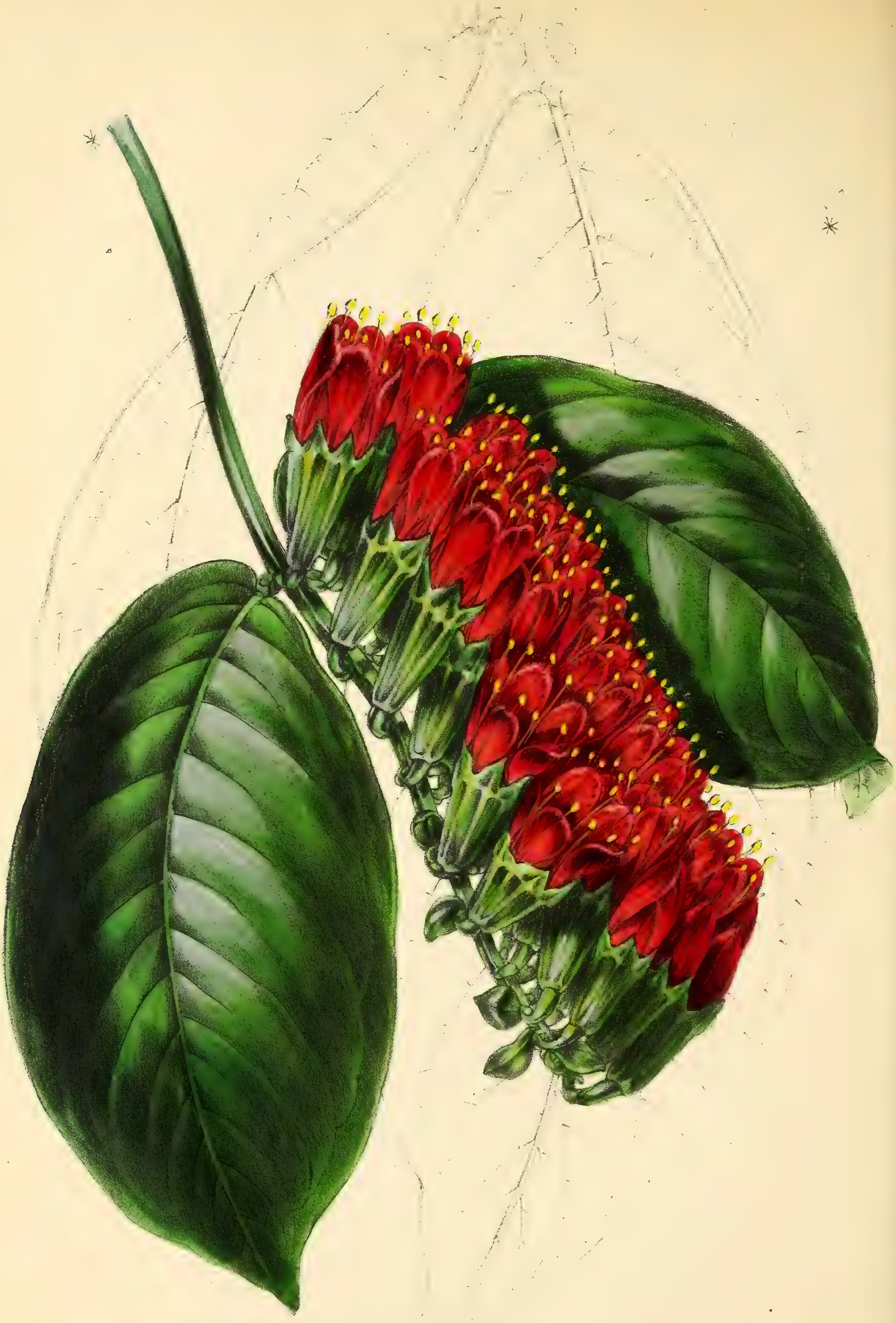
Prior to removing them entirely from the greenhouse, its lights or sashes should be left widely open for a week or a fortnight (closing them only during heavy rains and rough winds,) and gradually taken away altogether. This will inure the plants to the change, and save their leaves from being scorched, or from acquiring a yellowish or brownish unhealthy tinge. When finally taken out, they ought not to be huddled together in close groups, as is the common practice, but set at a sufficient distance from each other to receive the full advantage of light and air. The finer-rooted species, whose branches do not shade the soil in which they are growing, must, if exposed at all, be set somewhere where the whole plant or its roots can be partially shaded from the midday sun ; and this shade can be obtained from trees, from a hedge, or from a wall or building. That from trees will, perhaps, be best, since they will not tend so much to confine the air. A hard impenetrable surface is necessary to stand the pots upon, that no worms may enter by the lower aperture. To provide this, where stone cannot be had, a sort of asphalte, composed of gas-tar and sifted ashes or road sand, made hot, mixed, and applied in a fluid state to the depth of two or three inches, is an excellent substitute. By covering the surface with sifted road-sand, and applying a little of this whenever the composition is inclined to become fluid at the top, a hard and most durable kind of pavement will be obained. The gas-tar can be procured for little or nothing at any gas-works, and the labour of putting it down is very trifling.

While the greenhouses are empty, they should be thoroughly cleaned, repaired, painted, and whitewashed. Cleanliness is not only essential to their good appearance, but to prevent them from harbouring insects and dust, which are at all times an annoyance to the cultivator, and a great cause of injury to his plants. It is a proof of bad management when these things are done while the plants remain in the house, or late in the year, and also occasions much inconvenience, as well as great detriment to the specimens. When the greenhouses are completed, and everything thoroughly dry, the flues or heating apparatus being likewise put in order or cleaned, the stove plants can be transferred thither while the stoves are similarly repaired. We must not fail to observe that greenhouse plants which are taken out of the houses should always be placed where they can readily be transferred to the houses, or to sheds, or beneath other coverings, on the occurrence of heavy and continued rain.

To greenhouses, until the plants are taken from them, and to all kinds of stoves, air should be given more liberally than it has been since last autumn. Permanent plants, that actually demand it, may be potted ; but it is better not to shift specimens after the present time, if it can be obviated. Gesneras, *Achimenes coccinea,* and such like plants, ought, when they have ceased flowering, to be allowed to die down by degrees. Their decay must not be precipitated ; nor should they be excited to continue growing. Just enough water to preserve them from flagging will be the best assistant to their natural defoliation—more or less would alike be harmful.

Camellias and tender Rhododendrons may be placed out for a month behind a wall, or in some shaded situation where the noonday sun cannot reach them. They will be benefited by air, but not by too much light. Cereuses may also be removed from the house about the end of the month, and a full exposure will rather improve than hurt them. Pelargoniums can still be kept in a rather confined atmosphere till they have formed good new shoots, when they should be rapidly passed to the greenhouse, and from thence to a frame or pit, which can ultimately be left open almost continuously.

The stock to fill the flower-garden and borders next summer must now be thought of. Where plenty of frames for preserving it in winter are possessed, propagation cannot, after this, be begun too soon. Fuchsias, Heliotropes, Calceolarias, and the extensive tribe related to them in habit, can be increased forthwith from cuttings. A little prepared stable litter, made into a hillock, and covered first with pieces of inverted turf and then with soil, or sawdust, or old bark, will serve to support a few hand-glasses or a frame, and to afford heat enough both for multiplying the above common plants, and also the more simple greenhouse and stove species. The cuttings can be planted in a bed of earth, or, what is better, placed in pots, which should be plunged in either of the before-mentioned materials.



S. Holden del^t & lith

Combretum grandiflorum.

COMBRÈTUM GRANDIFLÒRUM.

(Large-flowered Combretum.)

Class OCTANDRIA.

Order. MONOGYNIA.

Natural Order. COMBRETĀCEÆ.

Generic Character.—*Calyx* with a four-toothed deciduous limb. *Petals* four or five, inserted at the top of the calyx. *Stamens* eight to ten, exserted. *Ovaries* two to five, ovulate. *Style* filiform. *Fruit* four or five-winged. *Seed* one, pendulous.—*Don's Gard. and Botany.*

Specific Character.—*Plant* an evergreen shrub. *Stems* climbing, hairy when young. *Leaves* opposite, oblong, acute, hairy. *Spikes* short, axillary, or terminal. *Bracts* ovately oblong. *Calyx* pubescent. *Flowers* large, secund, not expansive, bright crimson-scarlet. *Corolla* with erect, obovate, obtuse petals. *Stamens* long.

From the botanical catalogues we gather that this handsome plant was introduced to England from Sierra Leone in 1824. Yet it cannot have been much diffused at that time, and has possibly been altogether lost; for it is only lately that we have met with it in a flowering condition, in one of the stoves of Mrs. Lawrence, Ealing Park. From this establishment we were privileged with the opportunity of drawing it in June last.

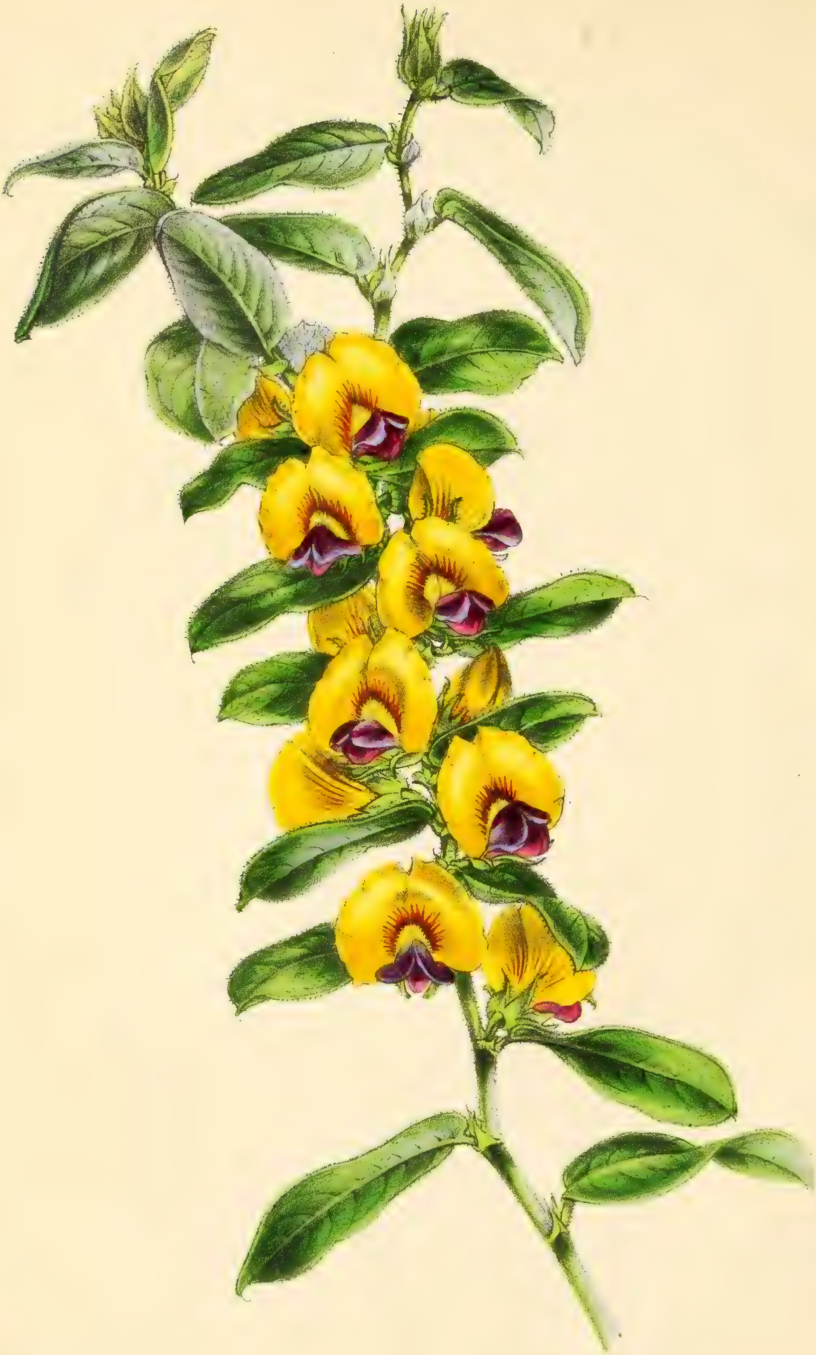
It does not possess that copiousness of inflorescence, which is apparent in the freely-branching and elegant spikes of the old *C. purpureum*, (now *Poivrea coccinea*), but its habit and foliage are rather superior to those of that plant, and the peculiarity in its mode of flowering must be considered a recommendation, inasmuch as it affords an essential variety in a collection of stove climbers.

The growth of this species is somewhat freer than that of the plant just named, its leaves are a trifle larger and better, and the young branches have a more elegant, graceful, and wavy aspect; or, in other words, are relieved of that rigidity and shrubbiness, which rather detract from the appearance of *P. coccinea* as a climbing plant. The blossoms are arranged in altogether a different manner. Issuing from both sides of the principal stalk, their short pedicels curve upwards, so as to give them the appearance of two rows of flowers, placed side by side, on the upper surface of the spike. Their nature or their closeness, too, prevents them from expanding much; and though they are in themselves really large, they do not occupy a great space.

Coming from the low districts of Sierra Leone, it is presumable that the species requires a tolerably high temperature, with a moderate share of atmospheric moisture. The difference occasioned in the aspect of *P. coccinea* by variety of treatment would be quite amazing, were it not accordant with general experience. Kept in an ordinary pot, with a poor soil, rarely shifted even at the end of the year, and placed in a dry stove, it grows and blooms, it is true, but never realizes its genuine luxuriance or beauty. Planted out in a bed of rich earth, and favoured with a congenially moist heat, it gains, on the other hand, a splendour which is truly astonishing. And we believe *C. grandiflorum* alters similarly under the like influences.

It ought to have a compost of good loam, leaf-soil, and heath-mould, with a little sand. The two former should constitute the body of it. An Orchidaceous house, which is kept warm and moist, would be an excellent situation for both this plant and *P. coccinea;* and, by the appropriateness of their shade, and the richness of their splendid blossoms, when associated with those of such plants as *Stephanotis* and *Allamanda*, and *Ipomœa Learii*, they would contribute a delightful attraction to such a structure. *C. grandiflorum* can be multiplied by cuttings.

We have no knowledge of the existence of a previous plate.



S. Holden del & Lith

Lalage hoveæfolia.

LÀLAGE HOVEÆFÒLIA.

(Hovea-like leaved Lalage).

Class.
MONADELPHIA.

Order.
DECANDRIA.

Natural Order.
LEGUMIN̑OSÆ.

Generic Character.—*Bracts* of the flowers deciduous, dry, included. *Calyx* two-lipped; upper lobe bifid; lower one three-parted; all the segments setaceous. *Vexillum* plane, subrotund, emarginate. *Keel* obtuse. *Stamens* all connected.

Specific Character.—*Plant* an evergreen shrub. *Branches* weak, pubescent. *Leaves* oblong-lanceolate, mucronate, subcordate at the base. *Stipules* somewhat ovate, acuminate. *Bracts* ovate-lanceolate, silky. *Calyx* with its upper segments connate to the middle. *Vexillum* bright yellow. *Wings* and *keel* reddish purple.

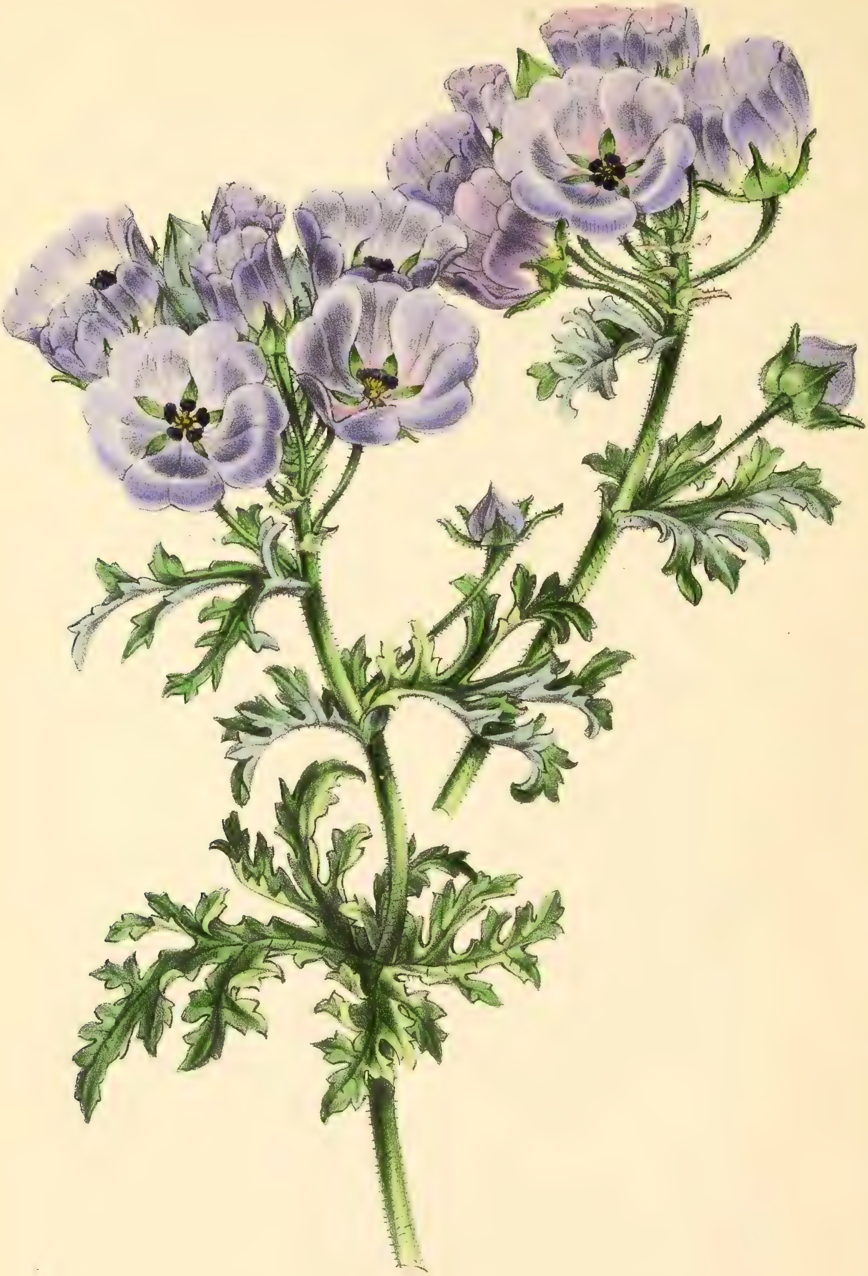
The pretty *Lalage ornata*, brought into notice several years ago by Mr. Knight, nurseryman, of Chelsea, has ever since retained its value as a greenhouse shrub, on account of the extreme compactness of its habit when properly grown, and the lively beauty which was described as existing in its numberless flowers. Unquestionably, if there be anything in a name,—and few will deny this,—one which belonged to a peculiarly facetious and sprightly lady, immortalized by Horace, and which was applied to this plant on account of its being emblematical of those qualities in its gay and joyous colours, ought to secure our esteem. But without any desire to disparage the species, we have always thought there was an indescribable dulness or dinginess in the tints by which its blossoms are shaded, and that it was surpassed in liveliness by many plants which are far less sought after.

Undoubtedly, from its dwarfness, its bushiness, and denseness, as well as from the profusion of its moderately showy blooms, it is worthy of general culture. Yet we would have it prized for its true merits, and not for that pre-eminence of gaiety which we cannot ascribe to it.

L. hoveæfolia, a drawing of which we are now enabled to introduce, through the kindness of Mr. Low, of Clapton, who supplied the subject of it last February, is, to our mind, a sprightlier species than *L. ornata*, as far as relates to the flowers. These are of a clearer yellow tint in the standard, and the wings and keel have a pleasing purplish hue instead of a dusky brown. But it wants the close and erect habitude of its ally, and is apt to attain a disagreeable laxness. In the specimen which we examined, the branches were weakly, and inclined to straggle; though this may possibly have been due to some peculiarity of treatment, or to the absence of a little attention in stopping the shoots. Unlike *L. ornata*, which has only a partial pubescence, lying close to the surface of its leaves and shoots, the foliage and branches of the present plant are clothed with a weak but very perceptible down. The flowers are axillary, and, as will be perceived from our figure, by no means lacking in ornament.

To cultivate the plant favourably, it must be potted in light loam, with which a small portion of heath-mould may be mixed. The shoots should be stopped occasionally, while they are growing, in order to make the specimen bushy, and to hinder its branches from rambling too much. At all times, it ought to be retained in a very light and airy part of the greenhouse, and carefully watered only when it really needs it. Attention to these particulars will be the production of a handsome and valuable accession to the greenhouse. Through the medium of cuttings it can be easily increased.

The species is a native of New Holland, whence seeds were sent to this country last season, or the preceding year.



S. Holden, del. & Lith.

Malva campanulata.

MÁLVA CAMPANULÀTA.

(Campanulate-flowered Mallow.)

Class.
MONADELPHIA.

Order.
POLYANDRIA.

Natural Order.
MALVÀCEÆ.

Generic Character.—*Calyx* five-cleft, girded by a three-leaved involucrum; leaflets oblong or setaceous. *Carpels* capsular, many, disposed in a round head.—*Don's Gard. and Botany.*

Specific Character.—*Plant* subshrubby, deciduous. *Stems* partially decumbent, downy. *Leaves* alternate, sessile, or embracing the stems, thrice-pinnate, with seven or eight principal divisions, and numerous mucronulate segments; the whole hairy. *Stipules* ovate, dry. *Bracts* often bifurcate, also dry. *Calyx* regular. *Corolla* nearly campanulate; petals obcordate, with a notch in the centre, not curving outwards at the margins, pale lilac.

In calling at Messrs. Henderson's nursery, Pine-apple Place, Edgeware Road, a few years ago, we were arrested by the beauty of this exceedingly interesting little Mallow, which bloomed most liberally throughout the entire summer, both in the greenhouse and the open border. It bore the name under which we now publish it; and as this is certainly expressive of the very distinct form of the flowers, and as we know of no existing description which is applicable to it, we adopt the title without any hesitation.

The *M. campanuloides* of Messrs. Loddiges, figured by these gentlemen in their beautiful Botanical Cabinet, is, as they assure us, and as we ourselves thoroughly believe, an essentially different species, and it has probably ceased to exist in British collections. *M. purpurata*, again, which comes nearer to our plant in its growth and flowers, has the latter of another shape, and is not nearly so elegant and free-blooming a species.

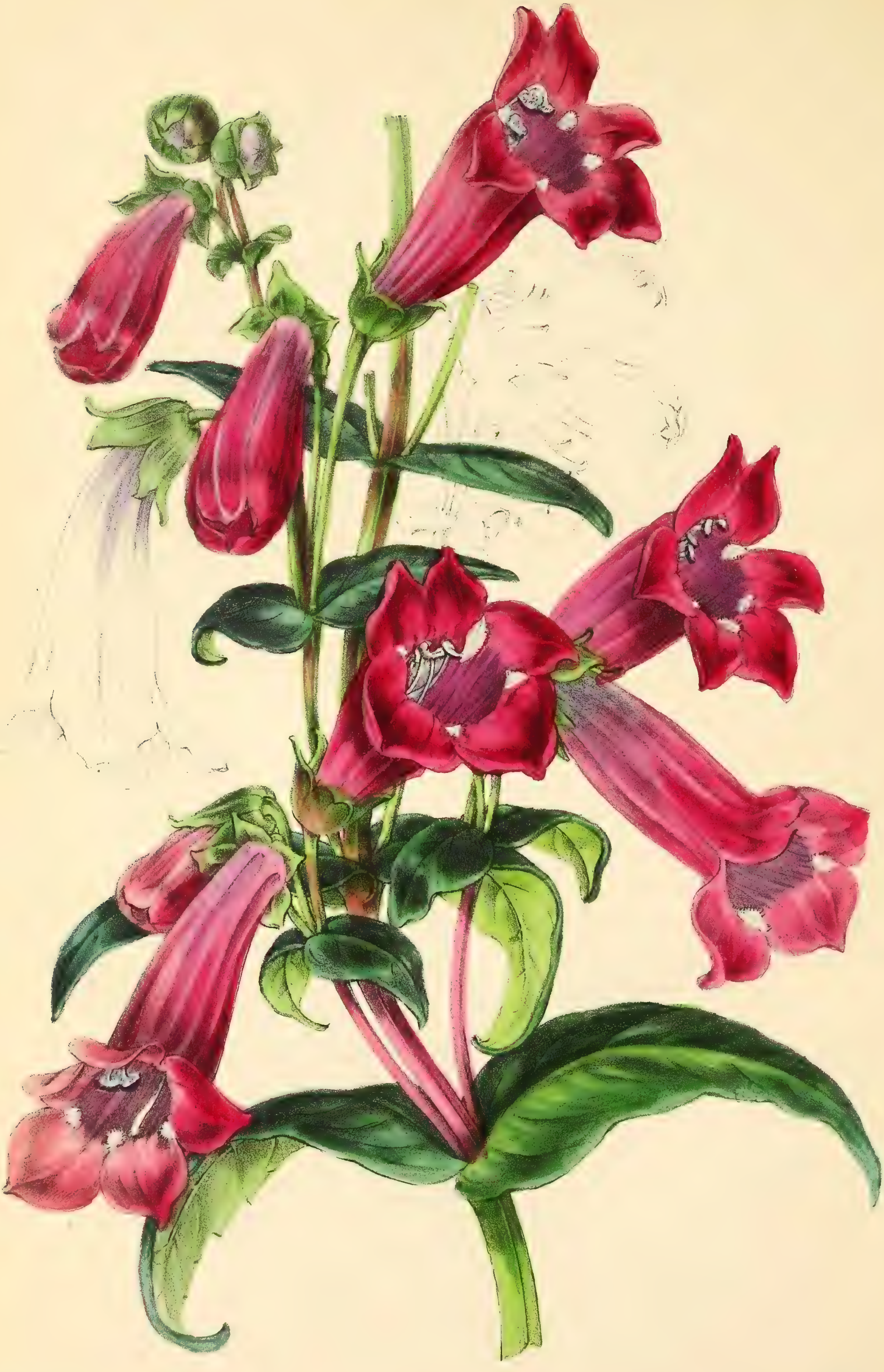
Indeed, the blossoms of *M. campanulata* excel, in figure, those of any other species of the genus, and are farther removed from coarseness and vulgarity. Their pleasing cup, or depressed bell-shaped form, and the regularity as well as perfect filling up of their outline, charmingly relieved by the slight indentation between and in the centre of each petal, give them a powerful claim to our esteem.

The stems of the species are exceedingly numerous, and inclining downwards at the base. They are well covered with frequently-divided and graceful foliage, and the flowers are borne in great abundance at their summits, expanding in succession from June till the end of August or September. The colour of these is a pale and delicate lilac, varying, sometimes, to a pinkish tint.

To cultivate it propitiously, it is only necessary to give it an open loamy soil, and put it in a pot of moderate size, never suffering it to want water. After it has done flowering, its stems can be cut down, and the pots placed in a cold frame for the winter, watering the roots very sparingly, and keeping the plants as hardy as possible. Planted out in the month of May, it makes a beautiful bed or patch in the pleasure-garden, and will last in bloom a considerable time. It is propagated by division, by anthers, or by seeds. The latter it does not ripen freely.

Most nurserymen now possess it, although we still see it in the largest quantities at Messrs. Henderson's, who obliged us by permitting the annexed representation to be made in the summer of 1840.

Malva has its origin in *malache*, soft, from the emollient and mucilaginous juices of many of the species.



S. Holden. del. & lith.

Pentstemon gentianoides splendens.

PÉNTSTEMON GENTIANOÌDES; *var.* SPLÉNDENS.

(Gentian-like Pentstemon, splendid variety.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
SCROPHULARIÀCEÆ.

Generic Character. — *Calyx* five-parted, with a distant solitary bract. *Corolla* ventricose, bilabiate. *Stamens* didynamous, with the rudiment of a fifth, which is usually filiform, and bearded on the upper side; anthers separate, usually glabrous. *Capsule* ovate, two-celled, two-valved, many-seeded. *Seeds* angular.

Specific Character.—*Stem* downy at top. *Leaves* lanceolate, quite entire, glabrous. Panicle composed of one, two, and three-flowered peduncles. *Calyx* with ovate segments. *Corolla* beardless; sterile filament glabrous.—*Don's Gard. and Botany.*

Var. Splendens.—*Flowers* altogether much larger, with a dash of light crimson and scarlet.

Many years have now passed away since the old *Pentstemon gentianoides* was brought to England from Mexico; though it is only within a very recent period that it has become a common ornament of our gardens. At first known solely as a plant fitted for pot-culture in frames or greenhouses, it has come to be regarded as a nearly hardy undershrub, and is very largely employed for filling the beds of flower-gardens, and for otherwise decorating our pleasure-grounds.

About three years back, there appeared in the nurseries three or more varieties of this species, each distinguishable by the shade or size of their flowers. Thus, there was a bright scarlet-flowering kind, which received the name of *coccinea*, and a much lighter-coloured sort that was never honoured with a title, and the present singularly handsome variety, which has larger blossoms than either of the others, and combines the scarlet of the *coccinea* with the dark reddish crimson or purple of the original species. To this the appellation of *splendens* has been applied, and the term is assuredly expressive of its truly splendid character; for it eclipses all the other known varieties, and we have deemed it eminently worthy of being depicted.

We believe we are correct in stating that this showy plant has not been raised by English art, through the medium of culture and hybridization, but was obtained from Mexican seeds; so that it is a genuine variety, and not a mere hybrid. And while its highly superior character will not eradicate the old species from those collections where more than one variety is desirable, it will commend it to the exclusive notice of such as can only grow a single sort. It is partly with the view of promoting that object that we here bring it forward; since, in some places, it is of the greatest importance that the best of everything should be cultivated.

Latterly, the management of *P. gentianoides* and its varieties, as potted plants, has fallen into disuse; and they are chiefly grown for the flower-borders. In effecting this, they are propagated, as Petunias, &c., by cuttings in the autumn, and, being placed in small pots, are kept in cold frames, free from frost, till it is time to plant them out. They should, however, receive one or two shifts in the early part of the spring, and have the points of their shoots several times removed. In this way, the variety before us can be perpetuated to any extent; and it deserves to be liberally provided for all sorts of gardens.

GARDENING AS A SCIENCE.

No. VIII.

The elementary constituents of the organic products of plants claim our immediate attention. Of late, a sort of conventional nomenclature has come into fashionable request. Everywhere we meet with chemical terms, and thus, the words oxygen, azote, carbon, and hydrogen, have become as familiar as blackberries: yet who correctly applies, and, still less, who philosophically explains them?

Our own professions are very unassuming; but we hope to collect some materials, and to hazard a few conjectures, which, if they do not satisfy, may at least stimulate, the inquiring mind; and, by leading to reflection, promote the research after truth.

The *elements*— that is, those materials beyond which no power of analysis has produced a change—the elements of vegetable organization are very few; two of them are discoverable in, nay, constitute the very essence of the air we breathe; therefore, we select as our leading subject the *air of the atmosphere.* If we look at the dates of all the discoveries of real science, we shall be surprised how small is the portion of time that has elapsed since the science of chemistry became based upon philosophic truth. The experiments of Dr. Priestley, which paved the way to all subsequent researches in pneumatic chemistry, were not commenced till about the year 1768; he discovered oxygen in 1774, but previously, in 1771, he investigated the subject of the purification or renovation of air contaminated by combustion and animal respiration. He ascertained that atmospheric air was not deteriorated by the growth of a sprig of mint, which he kept in it some months, and therefore presumed that, by the processes of vegetation, air spoiled by burning candles might be restored to its original purity. Accordingly, on the 17th August, 1771, a sprig of mint was placed in a vessel containing air, in which a wax candle had burned out, and on the 27th of the same month, he found that another candle burned perfectly well in it. To confirm or disprove the conclusion to which he had arrived, the deteriorated air was divided. One half he merely suffered to remain over water; into the other he put a sprig of mint; the air in the latter was restored, but that in the first portion would not permit a candle to burn.

Such is the account; and it remains to explain the causes of the several phenomena; this we shall attempt to do, but, previously, quote a few lines from Dr. Priestley's own remarks. "This restoration of air," he observes, "I found depended upon the vegetating state of the plant; for though I kept a good number of fresh leaves of mint in a small quantity of air in which candles had burned out, and changed them frequently for a long space of time, I could perceive no melioration in the state of the air. This remarkable effect does not depend upon anything peculiar to *mint*, for I found a quantity of this kind of air to be perfectly restored by sprigs of balm, groundsel, spinach, and some other plants."

To understand the philosophy of the deterioration of *air* by burning candles, we must observe that it is composed of two aërial fluids now called *gases*; one, and the chief as respects bulk, is the gas named *azote*, a word derived from the Greek *a*, (from, or contrary to,) and *zóe*, (life,)—this compound word expresses, then, the destructive quality of the gas, it being fatal to the organs of respiration. Now, as four parts of five of the atmosphere consist of this deadly air, it should appear surprising that the air we breathe is not, of itself, a medium of poison. But, mixed with the azote is another air or gas so energetic, so essentially vital, that although the volume it occupies is not greater than one-fifth of the whole, it entirely qualifies and subdues the noxious properties of the azote. This gas is termed *oxygen*. If four pints by measure of the former, be blended with one pint of the latter, an air will be produced exceedingly similar to, if not identical with atmospheric air, so far as respects its powers to sustain breathing life, and combustion. Whatever be the nature of the union which exists between these two chief elements of air, certain it is that burning bodies attract the vital principle from it, and leave the azote deprived of power to sustain either life or flame. In proof of this assertion, and thus in a degree to apply the discovery of Dr. Priestley, let a deep bell-glass, or glass shade, capable to contain a gallon, or more, be inverted over a dish, or other vessel, wherein its rim may dip an inch deep in water. Place a wax candle in a socket, weighted at bottom, so as to stand firm and erect in the dish, the entire candle being several inches above the surface of the water. The candle being lighted, invert the glass (which it is plain will contain *air*, and nothing else) over it. At first, a small portion of water will be expelled under the rim, in consequence of the expansion of the rarified air; but gradually, it will enter again into the glass, and rise above its former level. By degrees the flame of the candle will become more feeble, and finally be extinguished, when, if the first water-level have been accurately marked, and the contents of the bell ascertained, it will be seen that the water will have risen somewhere about one-fifth higher than it stood originally.

This experiment will suffice to prove that the air remaining in the glass can no longer sustain combustion; and if a mouse, or other small breathing animal be passed adroitly under the water into the depraved air (and this is readily effected by means of a chemical water-trough) it will immediately appear much distressed, and soon perish by suffocation. But the experiment is not chemically accurate, for, although the vital oxygen has been nearly attracted from the air, yet, as the cotton, and wax, or tallow of the candle, contain other elements of vegetable matters, which will form the subject of future notice, those elements yield a gas and watery vapour, that blend in part with the azote of the air remaining in the glass, and render it in a degree compound.

Our readers will now perceive that atmospheric air consists chiefly of the gas *azote*, and the gas *oxygen*, the former constituting about $\frac{4}{5}$ths of the entire volume; and that in every act of ordinary combustion, the fifth part—that is the oxygen, is attracted by the burning body, leaving the azote in its natural condition, fatal to life. But besides these chief constituents of air, it is proved that a certain portion of aqueous vapour, (i. e., water in the form of air,) perhaps about one part, a quarter, or rather more, in every hundred parts is always present, and likewise, a still smaller part of another of the products of combustion. We find the components of air laid down in the form of a table, thus :—

Azote by measure	77·5
Oxygen „	21·
Vapour „	1·42
Carbonic Acid „	·8
	100 ·

As animals cannot live in air so depraved, neither can plants. What therefore, we may inquire, can restore air, deteriorated as it is by the processes of respiration and of burning, always going on throughout Nature?

Dr. Priestley's experiments tend to prove that plants by their vital agency—that is *growing* plants, pour from their leaves a volume of oxygen sufficient to restore *that* lost by the air, and also to attract so much of the other deadly gas, called carbonic acid, which is produced by combustion, and also by the respiration of man and animals; for, in fact, breathing implies a slow but perfect phenomenon of combustion, as one of its processes.

It unfortunately happens, that all our experiments upon living plants are conducted with machinery, and under circumstances, which do not tally with the order of Nature. Therefore, as bell-glasses, certain gases, powerful sun-beams admitted through glass, and other concomitants, place a plant in an unnatural position, we must be somewhat jealous of our inferences. However, results have been observed which lead to some accurate conclusions; as for instance that of the deterioration of air by combustion and respiration, and also, to a shrewd suspicion that plants may be the renovators of the atmosphere.

Whether this latter doctrine be correct or not, certain it is, that *azote* is one of the components of *ammonia* (volatile smelling salts). And if it meet with the other—i. e. *hydrogen*, which must be liberated whenever water is decomposed, a chemical union may be formed by the agency of natural electricity, by which the azote will be brought into a condition wherein it is rendered not only soluble in water, but capable of being absorbed by the earth.

It will thus be apparent that the machinery of Nature is adequate to maintain all its elements within one harmonizing circle. Under certain circumstances indeed, not appreciable by man, disorder does for a time occur, epidemic poisons prevail, and sickness or debility is the inevitable consequence; thus the gardener perceives a healthy plant to flag, and dwindle.

But, as a whole, the harmony goes on; and that which threatens to become an instrument of destruction, is found to constitute a link only of that great chain of reconstruction which is never interrupted.

ON GROUPING ORNAMENTAL PLANTS.

Our last paper on this subject was confined entirely to trees, and the different modes of planting them together. We have here, then, to take up the question in a more enlarged point of view, and consider it in reference to all other kinds of plants.

Before we altogether pass from trees, however, we must just glance at the collections termed Arboretums, which these, in conjunction with all sorts of woody plants, help to compose. Looking at the plantation of trees as an object intended to produce ornamental effect, the general grouping and yet isolation of them, as practised in Arboretums, lies open to many objections. The most prominent of them have previously been exhibited in this Magazine, and we shall only revert to those intimately connected with our present topic.

The aggregation of several species or varieties of the same genus, or even of a number of specimens of one species, into masses of greater or less dimensions, is, as we have shown in our former essay, by no means to be found fault with in some circumstances, and under certain limits. Such a practice is, in fact, exceedingly judicious when rightly effectuated. Groups of Pines, Firs, Oaks, Elms, or other evergreen or deciduous trees, may, both on a large and a small scale, be highly interesting. And a Pinetum, containing all the kinds of Coniferous plants, is perhaps one of the most attractive features of which modern pleasure-gardens can boast. But in these cases, there is either a peculiar purpose to be answered, or a particular effect to be realized. Extensive masses of one species or genus of plants give the grandeur of uniformity and vastness, while lesser groups of the same attain a symmetry which a more varied assemblage would fail to reach, and which is almost indispensable in some localities. A Pinetum, again, combines in itself an essential variety yet harmony of appearance, such as no other tribe of trees could possibly occasion, and each of the objects being evergreen, and most symmetrically beautiful, is individually pleasing.

Besides, it must be remarked, that in the instances we have referred to, it is from the detachment and isolation of such groups that their interest arises, and not from the continuance of them, or their connection with similar ones. They stand out singly amidst other and far different forms, and thus, though simple and monotonous in themselves, assist, by their contrast to more diversified plantations, in giving greater variety as well as beauty to a scene. Were they perpetuated in regular succession, and an indefinite series of the like assemblages presented to the eye, their effect would be most disagreeable. And we therefore deduce what we conceive to be an important truth, that masses of one sort or tribe of plants, though fine and noble in themselves, are very far from being ornamental when they occur in regular order and union, unless the form or colour of the plants blend or contrast pleasingly with those of surrounding groups.

We are aware that in Arboretums, the trees are usually planted alone, so as to grow into handsome single specimens; and that consequently what we have just said will hardly apply to them. But when we speak of groups, we do not restrict our meaning to those in which the plants are close together, or intermingle with each other. They may be a considerable distance apart, so as to appear, when individually gazed upon, quite detached; and yet, regarded comprehensively, they may compose what we call a group. Arboretums are of this latter nature, and we must ever object to the plantation of trees in running masses, without any consideration of their aspect. If the genera, or divisions of the larger ones, were placed at somewhat remote intervals, putting appropriate plants around and between them, our objections would be reduced to the inquiry how far any number of species of one genus would combine favourably. And we think that an arboretum, ranged along the sides of a lengthened drive, planting the different genera, with due respect to harmony, and to beauty of outline, at intervals, and filling up the interspaces with whatever would best associate with the particular tribes in either direction, would be a really admirable feature in an estate.

For forming groups of shrubs, the same rule applies which we have laid down in relation to trees. There are many shrubby plants which are excellently adapted for planting in masses of one species, and others, of which a mixture of species or varieties is more desirable, but which do not need the aid of foreign genera to render their appearance favourable. Periwinkles, Tree Peonies, Vacciniums, *Daphne Cneorum*, several Genistas, Lavender, the common Savin, and numerous others, belong to the former class. To the latter may be referred Rhododendrons, Azaleas, Cistuses, Helianthemums, Berberises, &c.; while Roses, Heaths, and plants of a like character, may be ranked with both tribes.

Sometimes the peculiar soil or situation which shrubs require, has to determine the manner in which they are to be grouped; and, singularly enough, it is found that those demanding these peculiar circumstances, can be associated in a general mass with the greatest propriety, or will, for the most part, look well in masses of one species, or of the members of one genus. Of these, the tribe for which heath-mould and a somewhat sheltered spot are desirable, may be brought forward as examples.

Cultivators scarcely seem yet to have appreciated shrubs at their full value for grouping purposes. They are commonly employed only at the margins of plantations to complete the slope from the trees down to the flower-borders or walks, or planted very sparingly as detached specimens. Their extreme suitableness for growing in beds, furnished with one or many species, and having no trees in their centre, nor herbaceous plants round the outside, is most strangely overlooked in the majority of places. In the secluded dells which may exist, or be made in large domains, such beds, scattered effectively over the turf with which the spot may be covered, have an air of little less than enchantment, and can be aptly stocked with all kinds of the tribe termed American plants. Lawns in the vicinage of plant-houses, too, or fronting small residences, or even around the most stately mansions, may often be very delightfully decorated with plots of shrubs, which frequently look better than flower-beds, or groups in which trees, shrubs, and herbs are all associated. A Heath-garden, or an American garden, also, laid out in a very bold geometrical or irregular style, and traversed by grass or gravel-paths, the plants being arranged partly in single species and the rest more indiscriminately, is a highly pleasurable addition to an estate. There are, moreover, buildings of a floricultural or exclusively ornamental character ordinarily found in spacious gardens, in the front of which, something of the nature of a flower-garden is mostly requisite to connect them with the lawns beyond. Flower-gardens, particularly geometrical ones, are, we conceive, seldom appropriate to such spots, being too gay and artificial. And it seems to us that a few well-arranged clumps of shrubs would accomplish the harmonizing of so subordinate an edifice with the pleasure-grounds much more satisfactorily; and their fitness will be rendered the more complete if they are placed on the turf, instead of being separated by gravel-walks.

In the almost universal rejection of shrubs for such objects as we have thus suggested, it appears to have been forgotten that there are species which are nearly as dwarf as any herbaceous plant, and the kinds which we have in view grow as compactly, intermingle as readily, carpet the ground as thoroughly, and bloom as profusely, and many of them as durably, as the herbaceous hardy and exotic species with which beds are always supplied. They have, moreover, or at least most of them, the good quality of being evergreen, and thus of keeping the earth constantly and agreeably covered. It would be out of place now to particularize them, and we shall shortly devote a few pages to their enumeration and treatment.

Recurring to the disposition of shrubs in frequent groups, made up of separate genera, we affirm, as of trees, that no arrangement, founded on botanical affinity, can be otherwise than accidentally beautiful, and probabilities are strongly against even that. Chance and fortuity ought to be no part of a landscape gardener's dependence; and the admission of a principle in which all must rest on these, should be universally denounced. We admit that with reference to American plants, excellent masses may be obtained by properly arranging the species of each genus in detached groups. Still, there are exceptions to this, and cases in which a mixture of different genera would be more suitable; while the rule we seek to establish is not in the least degree weakened by these merely casual departures from it.

In regard to shrubs that constitute the boundary of a plantation, uniting it with the flower-borders, or making it slope towards the walk, the existing practice needs to be greatly modified. The assumption that plantations of any description should slope gradually down to the exterior edge or margin in an unvarying manner, is erroneous in principle, and unsightly in effect. It is to this mistake that the tame banks so common round the outside of shrubberies are wholly attributable. And to this is due their extreme dulness and meagreness. The outline of a mass of shrubs, or of trees flanked by shrubs, ought to be as diversified as art can make it. Tameness and uniformity are nowhere less tolerable. Large bushes, projecting forwards at different distances from each other and the verge; others, of various heights, standing out with the greatest irregularity in their rear; and occasional limited spaces, destitute of any shrub at all, should break up the flatness of a bank, and make it truly indefinable.

At the same time, however, there should be the general aspect of a descent to the boundary preserved. The irregularity we have advocated may seem incompatible with any such appearance; but the desired slope is easily produced by letting the minor plants predominate, and making those which are to diversify it the fewest. It is surprising to persons unaccustomed to such work, how trifling a quantity of larger specimens will serve to give boldness, and undulation, and variety to a shrubbery border. And the greater the number of species that is employed, the more perfect will be the fulfilment of that object. The correct estimate of beauty in this respect may be derived from analogy with another branch of the natural kingdom. In a rocky district, or an artificial rockery, it is not a straight slope from the walk or point of observation which pleases the eye. It is rather to rising eminences, and rugged protuberances and projections which almost impend over the observer, that he yields his admiration; while (except in the case of precipices, which are totally removed from our present consideration) a perceptible descent is actually maintained from the back to the foreground. How this illustrates what we have advanced, will be readily perceived.

That the extent to which our remarks are borne out may not be misunderstood, we may state that they are not adapted to all circumstances, without some qualification. Where beds of low shrubs, not more than twelve or twenty feet in diameter, stand out alone on a lawn, or, indeed, where any group, the dimensions of which can be seen at a glance, is planted on turf, the outside of such beds or group ought to come down to the grass, so that the two may, as it were, insensibly pass into each other. To introduce higher shrubs around the edges of beds of that sort would be completely unwarrantable and subversive of good taste. Yet, the surface of the group ought not to appear as regular as if it had been cast in a mould, and the destruction of its formality by placing two or three taller plants near the middle, and a few more within two or three feet of the grass, so as to leave room for smaller plants to complete the slope to the latter, will be both proper and desirable.

As to the ground outline of masses of shrubs, that must be decided by the nature of the locality, and the express purport of the group. In a geometrical shrub-garden, the figures should not be very small nor very close, nor have many corners or points. A collection of beds disposed with more freedom ought to be formed by the same rules, and be divested of abrupt recesses, or sharp turns, approximating their contour as nearly as practicable to rounded and regular curves. The circle, the oval, and every irregular shape that at all resembles these, are beautifully suited to shrubs. When beds of them are thrown down upon the turf before a house or conservatory, or other building, to enliven and vary the scene, it requires the greatest care to avoid bringing them too forward, so as to interfere with the broad open glade that should always front such erections, and also to prevent them from taking the aspect of being ranged in anything like a straight line. To this end, no two should terminate at the same distance from the centre of the glade; or, to speak more definitely, that part of every one which is nearest the middle of the lawn should not be at an equal distance from it with the same relative part of any other; nor should there even be the semblance of such regularity. The proper mode, where at all possible, is to let each bed, as it recedes from the building, fall away likewise from the centre of the lawn; abjuring, however, all uniformity of distance. The glade will thus gradually expand till it is lost in the more ample pleasure grounds.

Of the grouping of plants in greenhouses, stoves, and other floricultural erections, we proceed next to treat. And we must speak, first, of the taller shrubs and low trees which are planted out in conservatories and large stoves. At the commencement of the present volume, we published a method of confining the roots of these, in order to restrain the stronger sorts from outgrowing and injuring the more tardy growing kinds. We have now to take another view of the same evil.

It is quite customary to allow plants in conservatories to advance with their natural rapidity,—only pruning them now and then when they grow very straggling,—till the branches of many specimens intermingle with each other, and compose a dense thicket. Not to mention, at present, the mode of remedying this above alluded to, we shall deal with the fact itself. Some culturists seem to imagine, that if they can get a house so filled with a few plants in a presumedly natural condition, they have gained a very desirable object. Now, without referring to the destruction of the smaller, weaker, and more valuable specimens which such extravagant luxuriance will necessarily induce, we contend that wildness and disorder are not merely incompatible with good culture, but palpably incongruous and out of place in a greenhouse. To see large bushes, with tall bare stems, and all the branches and flowers in the upper part of the house, is, to our taste, highly annoying; for, in an artificial structure, we do not look for plants in a natural state. The expectation is grossly absurd. Were there room for realizing such a thing, —which there evidently cannot be,—the more rambling growth of an exotic under in-door treatment will entirely remove it from its natural character.

What we deem, therefore, the grand point to be aimed at with conservatory specimens, is to keep them dwarf, bushy, healthy, and symmetrical, and never to suffer them to grow tall without there is plenty of space for them, and all the other good properties accompany height. The groups, then, in the beds of conservatories, should be composed of perfectly detached specimens, and not of banks or thickets; only each specimen should approach and harmonize with its neighbour. In short, we would have the modern management of potted plants carried into the culture of transplanted ones. There should be no lank drawn up stems, and heads growing into one another; but each individual should stand aloof from the rest, and be in itself beautiful and worthy of examination. To effect that, fast-growing and widely-spreading plants must be discarded, and those chosen treated as if they were in pots; viz. have their shoots timely kept stopped, and their roots restrained within due bounds.

Although it is an acknowledged rule, in planting conservatory as well as hardy shrubs, that those which attain the greatest height should be put in the centre of the bed, or the back of a border, it admits of slight deviation in the first case, as we have explained that it does in the last. Conservatory specimens, happily, cannot be arranged with such extreme formality, because the real habits of the plants can rarely be sufficiently known, and so many trivial circumstances affect the rate and limits of their extension. However, when the treatment is properly regulated, precision enough may be arrived at to enable the planter to secure a good variety of surface. The shape and aspect of the plant, the form of the leaves, and the colour and figure of its flowers, ought all to be thought of in directing the arrangement; since, notwithstanding the contempt tacitly thrown on these matters in conservatories, they are fully as influential there as in greenhouses, flower-gardens, and shrubberies. Should the plants be in beds encompassed by a walk, there will be a necessity for making the arrangement tolerably regular, only varying it a little, as recommended for the small beds of showy shrubs which happen to stand on lawns. When the specimens are in borders, the irregularity which we have praised in the skirts of external shrubberies may be exactly imitated on a smaller scale.

Potted plants, that are grown in houses, are generally arranged on stages consisting of an ascending series of steps, the narrowest at the bottom; and the specimens are placed in a similarly graduated way, the smallest being set on the lower step, and the largest on the upper and broader one. Or, the stage is a flat one, and the plants are put upon it according to their heights, the lowest being placed in the front, and the highest at the back. By either method, a sloping bank is formed, which enables the eye of the inspector to pass readily over the plants in the foreground, and take in those behind. The appearance, too, is very orderly and appropriate. Without interrupting that order, however, or introducing anything like confusion, we are of opinion that the shape of stages might be altered with great propriety, so as to give more diversity of outline to the group; and that conspicuous large plants, or showy smaller ones elevated on an inverted pot, should be put here and there among the others to take away the formality of a regular arrangement, and to impart undulation and brokenness to the surface. On the latter particular, we would especially insist.

When greenhouse species are removed to the open air during summer, they are frequently set, either where they cannot be inspected, or in a very slovenly or formal way. As it is a principle of gardening that everything (and pre-eminently what relates to plants in pots) should be done in the neatest and best possible manner, we do not see why greenhouse plants should not be made the most of while in the open air. At Mr. Knight's nursery, Chelsea, there is a spacious area, environed with greenhouses, in which they store their plants through the summer; and they are arranged in beds, on a surface of ashes, with intervening walks of a similar material. The plan of the whole is complicately geometrical, the dwarfest plants being near the centre, and the larger ones gradually rising to the outside, where the largest stand against the surrounding buildings. In the beds, the plants fall in height from the middle on all sides. As they remain out for several months, a peculiarly interesting effect is created by this method of arranging them; and it is well worthy of being pursued in other and smaller gardens, where the nature of the accommodation would regulate the adaptation of the system.

Of the grouping of plants in flower-beds and borders, little is requisite to be said. When the practice of occupying each bed with one kind of flower is adopted, the principal subject for consideration is the colour, size, and character of the flowers. Where these are felicitously mixed and blended, nothing further, beyond the height of the plant, need be thought of with respect to arrangement. It sometimes happens, from local causes, that the division of the ground into small beds cannot be effected, and long, broad, or altogether large borders have to be furnished. Under such circumstances, the flowers can be mixed with nearly as rich an effect as when they are separated by beds; only, instead of filling part of the border with one sort, and another with a different one, they should be planted promiscuously, always paying due heed to harmonious combination. Occasionally the beds will be of such a diameter as to present, even when covered with the tallest available flowers, a displeasing flatness; and for such, a raised mound in the middle, supported by rustic wood-work, will afford the opportunity alike of varying the surface and of introducing another sort of plant into the middle. We have seen this plan followed with the happiest results.

Lest too great a prominence should appear to have been given to this topic, we will conclude by saying that the most valuable collection of plants, of any tribe, loses two thirds of its interest when ill-arranged; and that the poorest is invested with tenfold attractions when disposed to advantage. Intrinsic excellence is immensely heightened by attention to this circumstance, and positive demerit is immeasurably deepened by its neglect.

SUGGESTIONS FOR TRAINING CACTÆ.

From the very peculiar treatment which succulent plants require, their interesting nature, and the great variety of figure they assume, it has become the custom, which is yearly growing more prevalent, to cultivate them in a house by themselves, and not to mix them with other plants, nor even to keep them on a distinct stage in a structure filled with a miscellaneous collection. The uses of such an isolation cannot for a moment be disputed; and its recommendations, in an ornamental point of view, are of considerable weight. Possessing in themselves sufficient diversity to ensure beauty and liveliness of grouping, the effect of an aggregation of their singular forms is exceedingly imposing, and would be altogether nullified were they mingled with different orders of plants.

In succulent houses, however, there is always a serious lack of the objects which render other plant erections so engaging, and give them such a graceful as well as spirited appearance. We allude to climbers. These, it is admitted, are sometimes supplied by levies on the ordinary tribes; but there is an obvious incongruity in the introduction of common climbers amongst a collection of succulents, which constitutes a strong drawback to their employment, and ought, in our opinion, to determine their exclusion. Their place may, nevertheless, be made good by the use of the truly climbing Cactaceous plants, such as *Cereus grandiflorus*, *Pereskia aculeata* and *Bleo*, with such succulent shrubs as *Ceropegia stapeliæformis*. *Cereus speciosissimus* and *Jenkinsonii*, again, with *Euphorbia splendens*, and some others, can be trained with propriety against a wall or trellis, and will make a very good display in those circumstances.

Other modes of relieving the dulness occasioned by vacancy in the upper part of a succulent house, are the suspension of different Epiphylla, in baskets containing moss or earth, from the roofs, and also in the similar suspension of *Cereus flagelliformis* and *Epiphyllum truncatum* in pots. Additional variety may be gained, too, by grafting *Epiphyllum truncatum*, and various other species, on tall stems of *Pereskia; aculeata* and also by inserting grafts of the different Epiphylla on the stronger and equally high stems of *Cereus speciosissimus.* We mean, in the latter case, that each stock should consist of only one stem, which can be grown to almost any desired height.

All these methods, though highly useful, and really auxiliary to the promotion of a good object, are insufficient, without further aids, effectually to take away the tameness of aspect which exists in a succulent house, and which can exist nowhere and not occasion positive annoyance, or at least create a correspondingly tame impression.

Now we propose the avoidance of such monotony, or rather the adoption of means which shall relieve or banish it, in two ways. The first is by covering a wall with succulents after a novel manner, which we shall describe. Let us assume that the succulent house has a lean-to roof, sloping to the south, with a back wall of moderate height. We take this for granted, because such a house would afford more light than any other, and therefore be more suitable to the subjects of cultivation. On no account do we wish to contravene what we have lately said on the unsightliness of such structures, for we would have a house of equal size and similar slope at the back of the other, so that the external appearance would be that of a span-roofed erection. Camellias and other shade-loving plants might be kept in the northern compartment.

In the back-wall of the succulent house under notice, we would construct a kind of chamber resembling a flue, the inner wall of which should stand at least a foot within the general wall of the house. In other words, about a foot from the inside of the back wall, we would raise another wall, a brick in thickness, to within about eighteen inches of the roof. This would leave a chamber, the whole length of the house, nearly a foot in breadth. Nine inches or a foot below the top of that chamber it should be covered in with perforated tiles or slates, leaving an aperture of an inch or more between each. These slates are to form the base of a sort of trough in which to plant certain succulents, and the open interstices and frequent perforations are to secure good drainage.

Placing a quantity of broken potsherds, &c. in the bottom of the trough just mentioned, it should then be filled with tolerably rich soil. The earth in use for succulents is commonly of a very poor description, and largely intermixed with lime-rubbish. The benefit of this last is undoubtedly in its facilitation of drainage, and a few pieces of broken sand-stone will be greatly preferable. Sterile soil, moreover, is only fit for particular kinds of Cactæ, and an actually nutritive compost is better for many. That of which we are speaking, should be composed of light loam, a little heath-mould, and leaf-soil, with the addition of the reduced sand-stone already named.

In the trough thus filled, we would plant a number of healthy specimens of *Cereus flagelliformis*, and train their stems down the wall as they advance in growth. The situation would be highly favourable to the culture of the species, which demands a great intensity of solar light; and as its branches are naturally pendent, and will not thrive when supported erectly, it would doubtless flourish most luxuriantly in such a position.

But the principal end of the plan, after the specimens have been planted a few years, and gained both strength and length of shoots, is to employ these as stocks on which to graft *Epiphyllum speciosum*, and numerous related plants. By inserting them liberally all over the branches, there will, at the expiration of two or three years, be realized a surface which, for profusion of blossoms, and variety in their colours, will be almost without a parallel in the whole range of floriculture.

To contribute towards covering the wall more speedily, a similar trough may be prepared at the foot of the wall on a level with the stage, in which the allied species of ascending habits, as *Cereus Mallisonii* and *Colvillii*, may be planted and trained up the wall, using them like the descending plants for stocks, on which to graft the Epiphyllous sorts.

Hitherto, we have confined ourselves to the procuring variety by clothing the back wall of the house. Of still greater moment is the furnishing of the upper portion beneath the glass, and gaining ornamental objects which shall depend naturally from the roof. By a recent visit to a beautiful little establishment near London, we are enabled to make known a way of obtaining that desideratum, since the plan we shall sketch is there carried out with remarkable success. It is simply to train the *Pereskia aculeata* in any requisite quantity over the roof, or up the rafters, and graft upon it various species of *Epiphylla*, especially the varieties of *E. truncatum*, as well as *Cereus flagelliformis*, and some others. These, hanging down loosely into the air, impart, at all times, a most delightful variety, and when in bloom must be striking and beautiful in the extreme. It is merely necessary that the *Pereskia* be planted in a good free soil, and that its roots be not subjected to prejudicial influences, of which shade and too much water may be particularly specified.

It must not be surmised that the adoption of any of these hints is to be confined to succulent houses. There, of course, the systems will be most appropriate. But they will be as productive of interest, and almost as successful, in any common stove, or a house of a temperature between that of the stove and the greenhouse.

FLORICULTURAL NOTICES.

NEW AND BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR AUGUST.

Alstrœme'ria nemoro'sa. A handsome species, which "first flowered in the winter of 1841—2, in the greenhouse of Messrs. Veitch and Son, of Exeter. The roots were found in the Organ Mountains of Brazil, by Messrs. Veitch's collector, at an elevation of about 3000 feet. One of the plants, having been set in the open border, has endured the winter, as well as *A. aurea*, and was moved in the spring; but in consequence of having been planted out late, the flower-stem produced in the autumn was cut by frost." It is thought by the Hon. and Rev. W. Herbert to be nearly related to *A. aurea;* but Sir W. J. Hooker remarks that "its almost campanulate and nearly regular flowers, the marking of the petals and sepals, the shape and size of the leaves, and the colour, indicate a species quite distinct from *A. aurea*," and from every other member of the tribe. It has reddish sepals, with a yellow band down the middle, and yellowish petals, a little spotted below. The month of May or June would seem to be its proper blooming period, as it was exhibited in the first of these at the great Chiswick show. *Bot. Mag.* 3958.

Aspa'sia epidendroi'des. This is a rather showy Orchidaceous plant, the flowers of which last a considerable time, and change their colour after being expanded a few days. They do not, however, open with sufficient boldness, and too often present a starved appearance. They are produced in a short upright raceme, the sepals and petals being almost covered with broad transverse brown bars or blotches on a yellowish ground. The lip is large and whitish, with a bright lilac or purple centre. It changes to a pale buff or brownish hue. "It is an inhabitant of Panama and Columbia, and has frequently been sent by Mr. Skinner from Guatemala." The specimen figured was "communicated in the early spring of 1842, from the rich collection of Orchidaceæ at Pellengar, by its possessor, Dillwyn Llewellyn, Esq."

Bego'nia crassicau'lis. Introduced from Guatemala to the Horticultural Society by Mr. Hartweg. "It has the singular property of producing its narrow panicles of white and pink flowers without the leaves. In the month of February they appear in profusion upon rugged, fleshy, gouty stems, and the leaves are not formed till some weeks later. Each flower consists of two sepals only, which, being rounded and convex, give the appearance of a bivalve shell; or, when the flowers are unexpanded, the blossoms may be compared to clusters of fourpenny-pieces." The species is allied to *B. heracleifolia*, with which it much agrees in the form of the leaves, but in that species the flowers appear in cymose panicles on the end of long erect peduncles, and at the same time with the leaves. The angles of the fruit, too, are much rounded off. "Like all the genus, it is very easy to cultivate, requiring nothing more than a cool damp stove, and any sort of light peaty soil." *Bot. Reg.* 44.

Bigno'nia pi'cta. Messrs. Rollisson, of Tooting, flowered this elegant climbing plant in March last, and it is probably a native of Beunos Ayres. "The large violet flowers, with deep rich purple veins, have a fine appearance, while the slender habit renders the plant particularly well suited for trellising in a pot." Its leaves are opposite and in pairs, simple, oblong, and acute. The flowers, too, are borne in pairs, and are large and specious. Besides being very ornamental, it is said to be as hardy as *B. capreolata*, requiring the same treatment. "Like all Bignonias, it should have a strong rich loamy soil; for although they grow vigorously in light sandy or peaty soils, they never flower freely under such treatment, and occupy much more room both for their tops and roots to grow in. It is increased from seeds or cuttings of the half-ripened slender shoots, put in sand, and treated in the ordinary way." *Bot. Reg.* 45.

Cobu'rghia hu'milis. Singularly dwarf, and scarcely possessing any leaves at the time of flowering, this little plant has a most curious appearance. It was "found by J. Maclean, Esq., near Palcamayo, on the Peruvian Andes, at an elevation of 10,284 feet, in a quarter where there were many wild bulbs, and wheat and potatoes were cultivated." Specimens were gathered in which the blossoms were perfectly erect, but this only occurs before they are fully developed. "The flower of *C. humilis* bends downwards, as it advances, after the germen and scape, which were at first under ground, have acquired their full elongation; and it rises daily and falls at night, and hangs so far down over the edge of the pot, that its limb must be firmly pressed against the ground—unless, as seems probable, it grows naturally on steep banks." The blossoms are large and of a bright red colour. The species "flowered at Spofforth, in March and April, 1842, and perfected its seed. All Coburghias like a strong rich soil." *Bot. Reg.* 46.

Echinoca'ctus tenuispi'nus. "Cultivated in the Royal Botanic Gardens of Kew; where it must be confessed that the flowers are very similar to those of *E. Ottonis*, of which Dr. Pfeiffer makes it a variety:—but, on the other hand, the form of the plant, a much-depressed globe, is quite different from that of *E. Ottonis*. The spines, too, are here much longer, and the native country of the two is very different;—*E. Ottonis* being an inhabitant of Mexico, while *E. tenuispinus* is stated by Pfeiffer to come from South Brazil. It flowers in July, and makes a pretty appearance with the copious bright lemon-coloured flowers, large in proportion to the size of the plant, and the red stigmas in the centre." *Bot. Mag.* 3963.

Habra'nthus prate'nsis; *var.* quadriflora. "This bright-coloured flower seems evidently referable to *Habranthus pratensis*. It differs from the description of Dr. Poeppig only in having the leaf not decidedly glaucous, the flowers four instead of three, and teeth irregularly serrate, which he describes as serrate. It is the only Habranthus we have seen with decidedly dentate processes." It was "sent by Mr. Veitch, of Exeter, also by Mr. Bridges to Mr. Bevan, from Valdivia. Flowered in May 1842, *in the open air*." *Bot. Mag.* 3961.

Mormo'des linea'tum. An interesting and curious plant, "native of Guatemala, whence it has been sent by both Mr. Skinner and Mr. Hartweg, who were attracted to its seat, among the most inaccessible branches of trees overhanging a deep stream, by its delicious fragrance. The flowers, when they first appeared, were dull olive green, and by no means handsome; they have since acquired a bright warm tint, and the markings upon them have increased in intensity till they have become quite ornamental. The lip is variable in form, always indeed covered with long loose straggling hairs, but having its lateral lobes sometimes not more than half a line long, and occasionally as much as two lines." The sepals and petals appear to be orange-coloured on the inside, streaked and blotched with brown, and greenish without. The lip is whitish, marked with yellow and purple. It requires only a very moderate temperature. *Bot. Reg.* 43.

PRI'MULA DENTICULA'TA. Northern India produces this pretty little species, which has been brought over and distributed by the Directors of the Honourable East India Company, through the medium of Dr. Royle. It has flowered in the Horticultural Gardens, Chiswick, and also with Mr. Veitch, of Exeter. Dr. Lindley states that, notwithstanding the usual dwarf condition of plants that were kept in a pot, the leaves of one "placed on some rockwork in a northern aspect are already a foot long, and it is therefore to be anticipated that a far more vigorous vegetation will be manifested by it. It is certainly quite hardy." Its flowering season is March and April, and it is said, to come into bloom, "in the ascent to Choor, (on the Himalayas,) in the earliest spring, when the snow has just begun to melt from the neighbourhood of stones and trees, or from situations exposed to the full influence of the solar rays." It demands "a rich loamy soil and a dry situation," and is propagated by division or by seeds. *Bot. Reg.* 47, and *Bot. Mag.* 3959.

VA'NDA CRISTA'TA. "An Epiphyte, with the habit of *V. Roxburghii,* found in 1818, on trees in Nepal, by Dr. Wallich, flowering in the month of April." The leaves are rather close, and pale green. The sepals and petals are greenish, and the lip is pouch-shaped at the base, expanding into a flatter and laminated surface, and terminated by two singular processes, resembling, in figure, the tail of a swallow, or of some kinds of fish. The labellum is very richly painted with brownish purple, and has a beautiful velvety surface. It was blossomed by Messrs. Rollisson, of Tooting, in March last, and has continued flowering almost ever since. The species must be grown on a log of wood, and suspended in a moist and warm part of the Orchidaceous stove. *Bot. Reg.* 48.

OPERATIONS FOR SEPTEMBER.

THE extraordinary droughts of the late summer have rendered it a particularly suitable one for the preservation of seeds, as they will have been thoroughly ripened in the open air. The present is the proper season for collecting those which have not previously matured themselves. It is a common practice to pull up an entire plant if it be an annual, or to cut off the whole of its spikes and clusters when it is a perennial, and then to suspend them in sheds for completing the ripening process. In their removal from the ground, their conveyance to the place of deposit, and their suspension where they will be exposed to casual shaking and to the action of the wind, it generally happens that all the ripe and fully-developed seed of the small-seeded plants is lost, and only the immature, shrivelled, and imperfect portions saved. This ought not to be.

To remove the above evil, each capsule, or head, or pod of seeds, ought to be individually plucked, just as it is matured ; and they will then need little or no drying, but may at once be stored away in drawers for the winter. These hints apply to all descriptions of plants, and as well to those in the greenhouse as to such as are in the open ground. There is an especial necessity for attending more to the seeds of Composite flowers ; for it is notorious that the annual kinds, with very few exceptions, can rarely be perpetuated to any extent while the seeds are so carelessly collected ; the majority of those sold by seedsmen being abortive. The fact is, that growers do not suffer them to remain long enough on the plants, or eradicate the plants themselves too soon ; and the consequence is, that none but the outer rows of seeds are ever perfected, the rest withering away to nothing.

From the recent and protracted dry weather, many shrubs and young trees will have been induced to shed their leaves earlier than usual, and such may forthwith be transplanted should their removal be contemplated. The time for transplantation is just after the fall of the leaf, as plants which are shifted at that period have an opportunity of getting established before the frost comes to hurt them.

That continued drought has a tendency to produce mildew, we have had a striking demonstration this season. On Roses and other plants it has appeared very copiously ; and there can be no question as to whether aridity or dampness has caused it in such a season as the present. Where it is likely to do injury, it can be destroyed by sprinkling a little flowers of sulphur over the parts affected ; but when the leaves on which it has fastened are beginning to decay, perhaps it will be better to leave it to its fate.

As a dry summer is favourable to the existence and perpetuation of insects, care should be taken to extirpate them wherever they may be found. Among the minor tribes, multiplication is carried on with such extraordinary rapidity, and in such prodigious numbers, that he who disregards them for a time on account of their fewness, considering the smallness of their number a sufficient plea for not effecting their destruction, lays up for himself a large store of future annoyance. All the old maxims regarding the importance of remedying evils timely, attach, with singular force, to the operations of the plant cultivator. And he who clears away insects directly they are discovered, not only saves himself much trouble, but spares both the plant they have attacked, and the others that are near it, from a large amount of detriment.

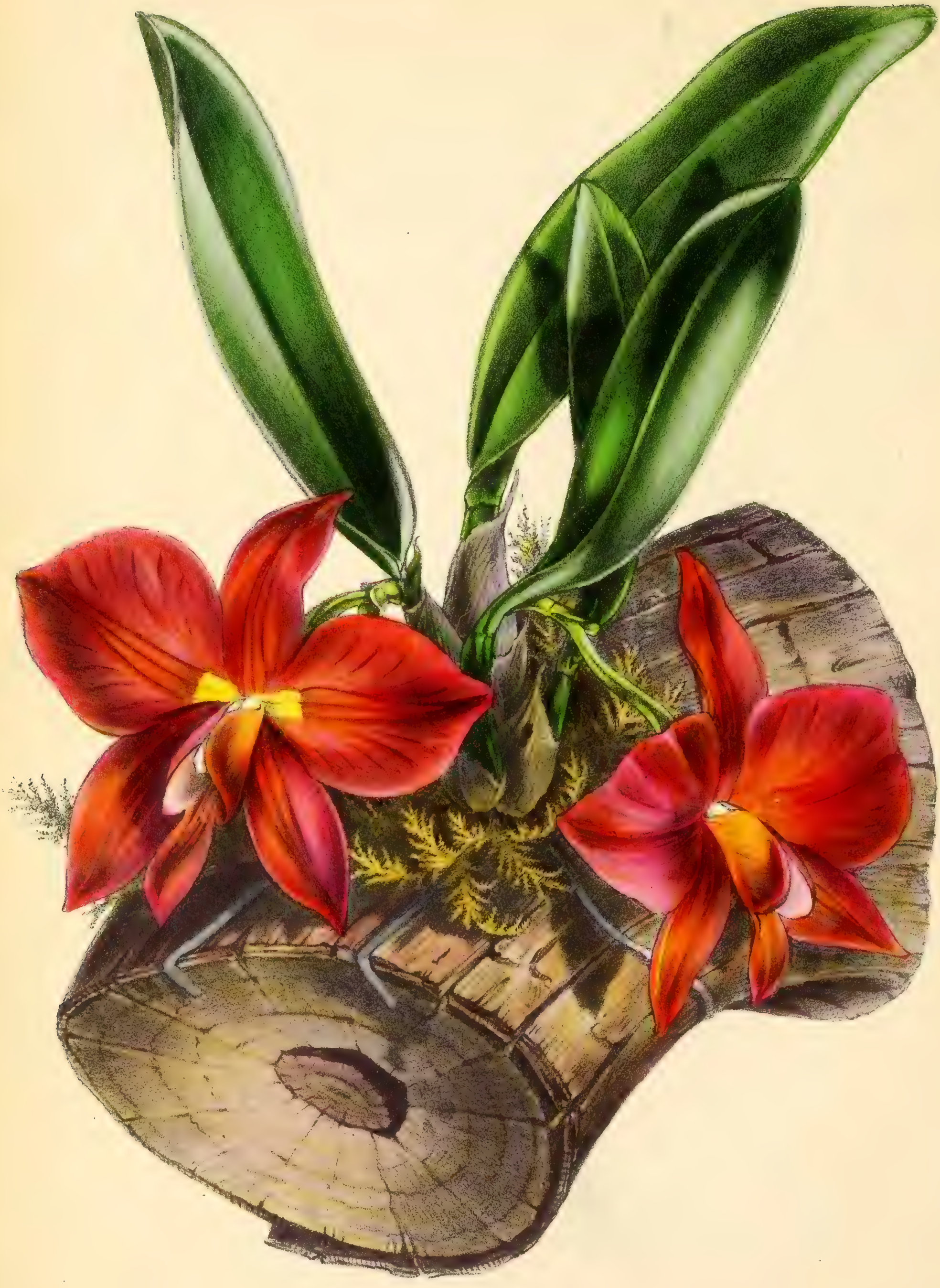
We have before advised that the occasion of turning greenhouse plants out of the houses should be seized for cleansing the latter, and putting them in thorough order. If the plants have been at all infested with insects, every corner and crevice should be duly washed out, and the surface of the earth beneath the stages or the trellis-like paths taken away and renewed. The eggs, or larvæ, or young of insects, are commonly placed in some retired and sheltered spot, and everything that can harbour them ought to be investigated or removed. Where wooden or iron trellis paths, covering flues, exist, they should be taken up, and the space beneath them, where rubbish is apt to accumulate, properly purified.

Ere the plants are returned to the houses, they, too, should be subjected to a complete purification ; washing insects and dust from the leaves, cutting off all decaying foliage, or other matters, and afterwards taking away the upper part of the soil into which insects may have dropped, replacing it with fresh, and washing the pots. Stove and succulent plants should further be cleaned in the same manner before they are shifted to the greenhouse, while the stove itself is similarly purified. If there are pits with bark or soil in them, these latter may be thrown away, and other earth or bark substituted, or only the portion that lies on the top may be changed.

The good influences of the dry weather on all potted species of plants should be allowed now to exert themselves fully in ripening their new wood. As to watering, they ought never to be permitted to flag, even though they should require attention more than once a day ; but neither ought they to be kept wet, or supplied as bountifully as if they were in a growing condition. All their advances after this time (save in the case of peculiar tribes, as Pelargoniums) must be restrained, and the young shoots cut off as fast as they make their appearance. Without these checks, the valuable flowering branches they have made will be reduced and enfeebled, and a foundation will be laid for bringing the plants into a sickly and straggling state.

In flower-gardens containing numerous beds, there is a necessity for securing some diversity in the arrangement of the flowers year after year ; and the easiest way of doing this is to have a plan of the spot, number the beds, and keep a list of their annual contents. The present month will be a favourable time for deciding how the plants are to be disposed next year, since the eye can judge best of anything of the kind when it has something to direct its scrutiny. Errors in taste, with reference to both colour and form, can now, moreover, be most readily rectified.

Budding can still be performed, if it has heretofore been neglected. Cuttings of half-hardy plants may be struck in a trifling bottom-heat to any requisite extent. Verbenas, and plants of an allied nature, should be layered in preference to being propagated by cuttings ; just placing the lower part of a shoot beneath the soil, and putting a little earth on it. Those herbaceous or other species which are wanted to bloom in the following year ought not to be allowed to blossom again now, which some of them will be inclined to do. Chrysanthemums must be timely supported by stakes, leaving only three or four stems, and tying these separately to the stake. Dahlia flowers may be guarded from earwigs by hanging pieces of bean-stalk, or similarly light tubular materials, on their branches. The insects will enter these, and can be shaken out and killed each day.



S. Holden, del. & Lith

Sophronitis grandiflora.

SOPHRONITIS GRANDIFLORA.

(Large-flowered Sophronitis.)

Class.
GYNANDRIA.

Order.
MONANDRIA.

Natural Order.
ORCHIDACEÆ.

Generic Character. —*Pollen-masses* eight, parallel before and behind; caudicula double, covered with powder; gland none. *Anthers* terminal, furnished with a lid, eight-celled. *Stigma* concave, with an obtuse beak. *Column* free, winged on both sides at the summit; wings entire, connivent above the crest of the lip. *Labellum* entire, cucullate, tongue-shaped, connate with the base of the column.

Specific Character.—*Plant* an epiphyte. *Pseudobulbs* small, oblong, tapering towards the summit, one-leaved. *Leaves* oblong, somewhat acute, thick. *Flowers* issuing from the top of the young pseudo-bulbs, apparently solitary. *Sepals* ovate-lanceolate, acute. *Petals* very broadly ovate, nearly obtuse. *Lip* three-lobed; side lobes folding over the column; middle one oblong, acute.

Such is the comparative smallness of this exquisite Orchidaceous plant, that we have had it introduced into our drawing as it was growing, including the block of wood on which it was fastened. Those who have no opportunity of seeing the living specimen, will thus learn its genuine habit, and persons who are not accustomed to witness Orchidaceæ, will gain a general idea of the epiphytal nature of the tribe.

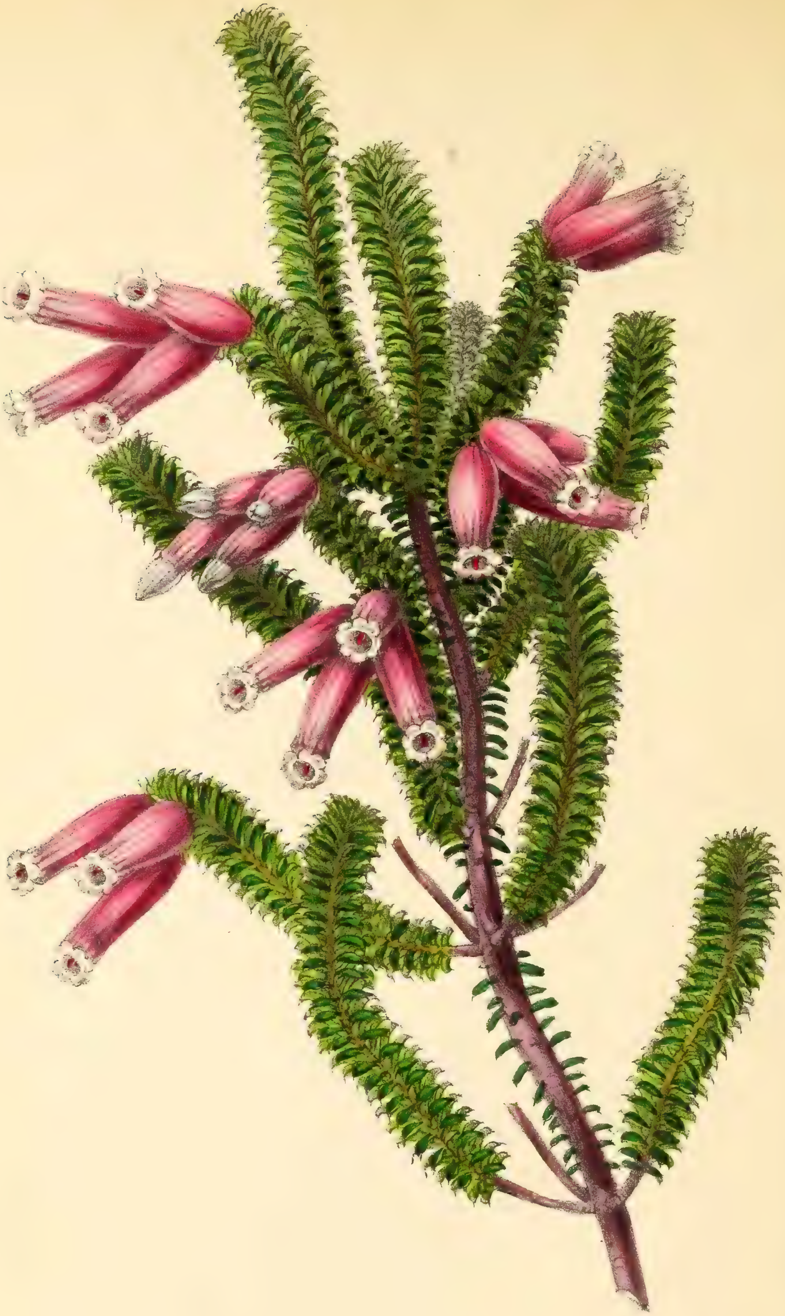
S. cernua, which is similarly dwarf, and has smaller pseudo-bulbs, grows very much in the same manner, and produces its numerous racemes of pretty red blossoms about the present period. They last for several weeks, and the species is one of the prettiest of epiphytes.

The plant before us is, however, much finer than *S. cernua.* It is larger in all its parts, but the blossoms, particularly, are three or four times the size, and exceedingly showy. Hitherto, they have been borne solitary, from the summit of the younger pseudo-bulbs, though it is quite possible that they may hereafter appear in racemes, like those of its ally. For so diminutive a plant, the size of the flowers is really extraordinary, and the stalk is made to curve downwards, apparently with the weight of the blossom. The colour is a rich cinnabar, variously tinted with crimson and orange, and pale orange or deep yellow in the centre. When in flower, the plant is not unlike a dwarf *Cattleya*, and this appearance, combined with the novelty of its colour in relation to that genus, makes it peculiarly interesting.

Our subject is a native of Brazil, where we believe it was found by Mr. Gardner, from whose native specimens or drawings a figure was some time ago published in the Botanical Magazine. Our plate is the first obtained from a plant that has bloomed in this country, and we owe it to Messrs. Loddiges, of Hackney, in whose collection it blossomed in October, 1841. A plant which seems to be the same species, showed flower last year at Messrs. Rollisson's, Tooting, but the blossom perished by accident before it had been unfolded.

Obviously the most natural way of growing this plant is to fasten it to a small log of wood. We must dwell specifically on the smallness of the block ; because many beautiful little plants are almost hidden by the large and unsuitable logs to which some growers attach them. It should be borne in mind that, as long as the wood appears *needful* for the plant, it is appropriate ; but when it is so large as to be more conspicuous than the plant itself, it becomes disagreeable and improper. It is necessary to insist on this point in regard to both species of *Sophronitis*, as it would be a pity that their charms should be diminished by so paltry a circumstance.

Besides fastening it to the wood, and suspending this to the roof of the house, little other attention is necessary. If a small portion of moss be placed around the bottom of the pseudo-bulbs, and over the younger roots, it will form a nucleus for moisture, and keep them shaded. The species flourishes well in a house that is only moderately warm and moist, and should have rest for three or four months, beginning about December. It is increased by taking off one or more of the pseudo-bulbs in spring, and placing them on another block.



S Holden. del & Litho

Erica Neillii.

ERÌCA NEÌLLII.

(Dr. Neill's Heath.)

Class.
OCTANDRIA.

Order.
MONOGYNIA.

Natural Order.
ERICÀCEÆ.

Generic Character.—*Calyx* four-sepalled, inferior. *Corolla* with four divisions. *Stamens* inserted in the receptacle. *Anthers* bifid. *Capsules* four-celled.

Specific Character.—A hybrid plant, with foliage like that of *E. aristata*, and flowers which have a long, pink, somewhat inflated corolla, with a white limb.

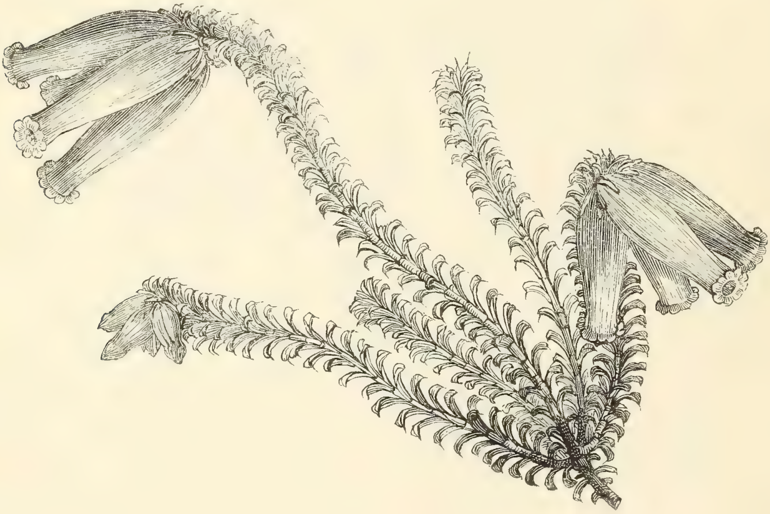
The very lovely Heath here represented is a hybrid between *E. aristata major* and *E. Linnæoides*. It was raised, as we understand, by Mr. M'Nab, of the Edinburgh Botanic Garden, and is designated *Neillii* after Dr. Neill, who resides at Cannon Mills, near Edinburgh.

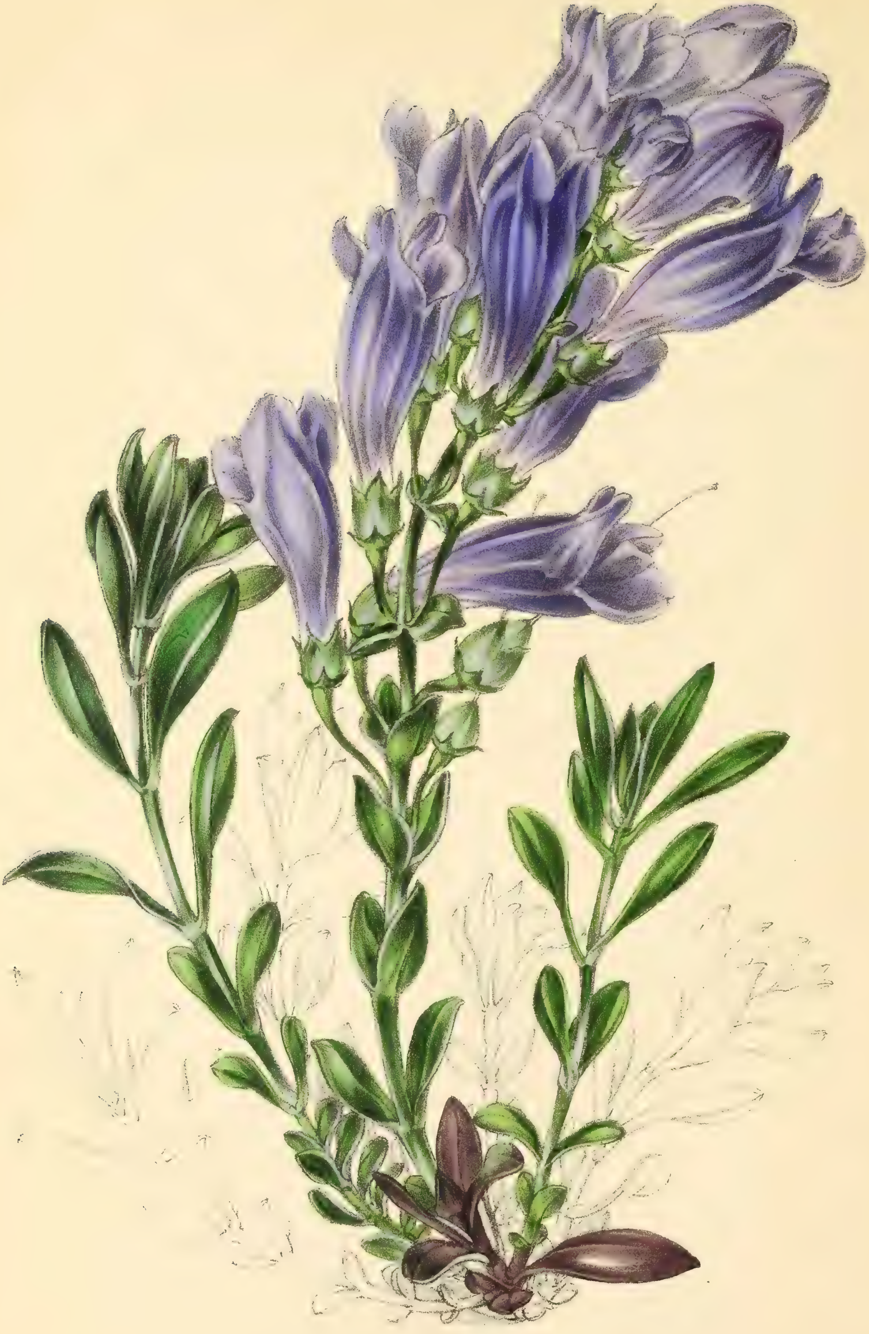
In habit, foliage, and flowers, it unites, within itself, the characters of both its parents. Its habit slightly resembles that of *E. aristata*, but is better, and has more of the erectness and bushiness of *E. Linnæoides*. The leaves and their arrangement are still more like those of the former, while they have somewhat of the length and closeness of the latter. The blossoms, too, are straighter in the tube, and less inflated than those of *E. aristata*, yet swell towards the base, and have a decided approximation in their shape to those of that species. They are produced, too, in terminal clusters, as in *E. aristata*. The colour is that of neither parent, but rather intermediate. It is a deep pink, inclining to light purplish at the base, and gradually becomes paler till it passes into white in the limb.

On the whole, it is an exceedingly elegant plant, deserving of general culture. We obtained our drawing from the nursery of Messrs. Young, Epsom, with whom it flowered profusely last summer. We have also noticed another hybrid, raised by cross-impregnation with the same parents, at Mr. Jackson's, nurseryman, of Kingston, Surrey. It is very similar to the present; but approaches a shade or two nearer to *E. aristata*, and is extremely beautiful. The woodcut inserted on the following page exhibits its character, and the colours of the flowers are just a trifle darker than those of *E. Neillii*.

Cultivators ought, by this time, to be tolerably familiar with the management of Heaths. There is one thing which we meet with, however, relative to their culture, that is commonly though most erroneously practised, and this is the employment of hard water, or that containing lime, for their sustenance. Wherever this is done, a quantity of the leaves invariably turn yellow and fall off: and no species can be long kept in health under such treatment. Those who wish to cultivate the genus, must supply their plants with soft pond or rain water, or they need never look for success.

The plant now figured is one of those which speedily indicate the existence of anything wrong in the above particular. Watered with hard water, its leaves turn sickly and yellow, as a preliminary to falling. But if well supplied with rain-water, it grows as vigorously and healthily as *E. Linnœoides*, which is known to be one of the most verdant of the tribe. All else that is requisite is an airy position in the greenhouse, careful potting, and shade from the fiercer of the sun's rays during the months of middle summer.





S. Holden del. & Lith.

Pentstemon crassifolius

PÉNTSTEMON CRASSIFÒLIUS.

(Thick-leaved Pentstemon).

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
SCROPHULARIÀCEÆ.

Generic Character.—See p. 175 of the present volume.

Specific Character.—*Plant* an evergreen shrub, growing about a foot in height. *Stems* very numerous, slightly decumbent. *Leaves* opposite, sessile, linear-lanceolate, acute, thick. *Flowers* in a terminal spike, opposite, axillary, pedunculate. *Calyx* with two rows of short segments. *Corolla* large, showy, light purplish blue. *Capsules* ovate or conical.

In the handsome and valuable genus *Pentstemon*, although nearly all the species are accounted herbaceous perennials, they are principally of a half-shrubby character, and one division may be made to comprise the hardy suffruticose plants, another those which are but partially hardy, and a third the hardy species, which are decided shrubs, or of which none of the branches perish in winter.

Every member of the genus is ornamental, and merits attention. The class last pointed out has, however, peculiar claims to notice for the ease with which they may be managed, and for their extreme beauty. Dwarf shrubs of so very ornamental a description are by no means of common occurrence, and a superior value, therefore, attaches to the few which do exist.

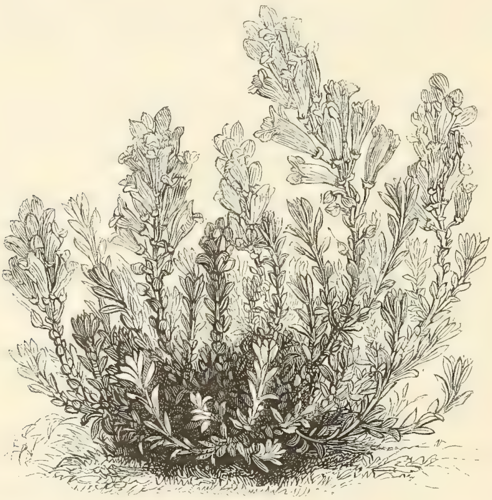
Besides *P. Scouleri*, which is of a similar character, we are only acquainted with *P. crassifolius*, which forms a low-spreading shrub, admirably suited for planting in the front of shrubbery or other borders, or even for associating together in beds or groups. The number of branches that it sends up from the roots, and the striking liberality with which it develops its fine spikes of flowers at the point of every shoot, are characteristic and excellent features, and give it a splendid appearance in the months of May and June.

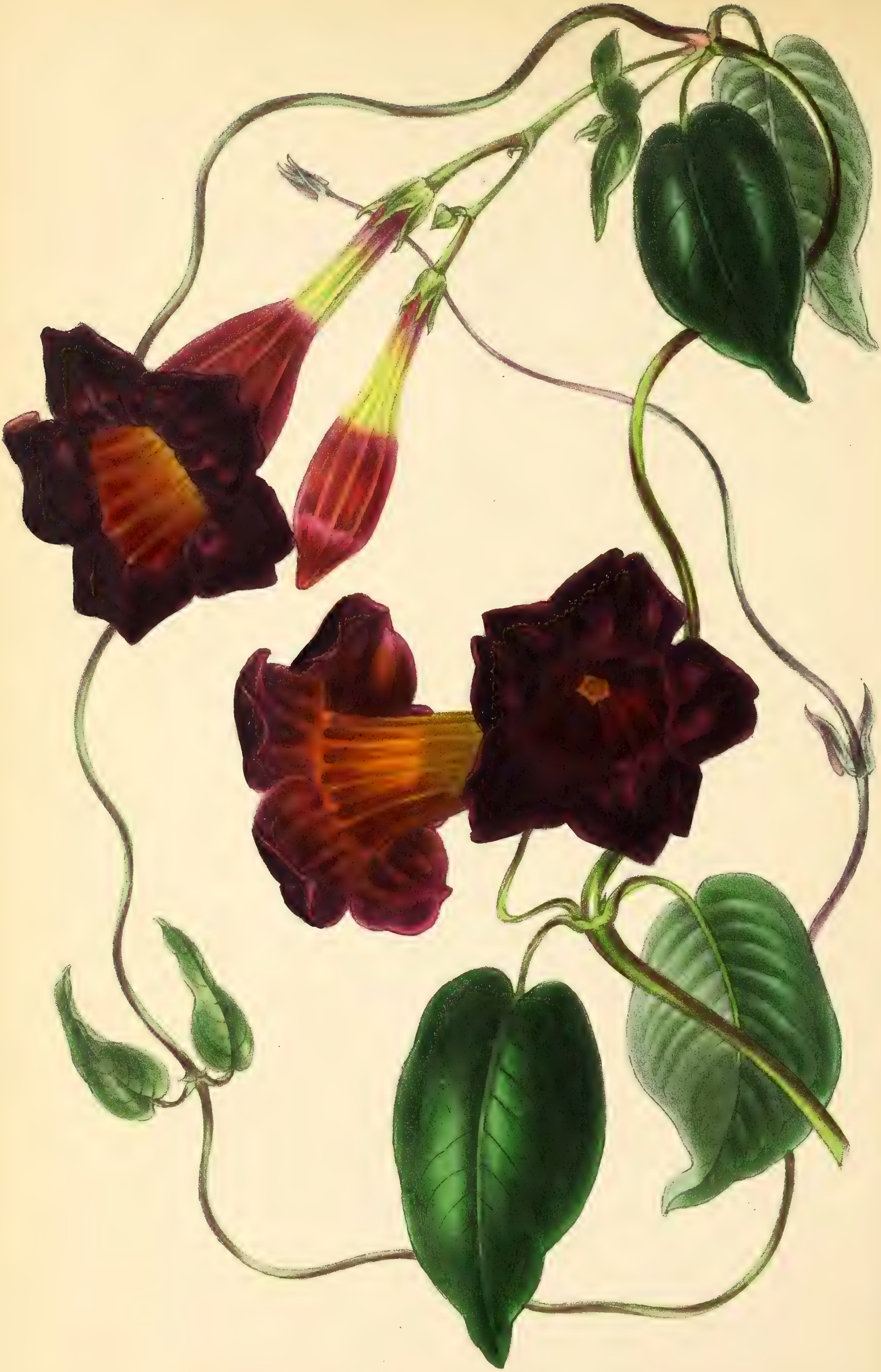
It is a North American species, introduced to England several years back, and now to be had of most nurserymen. It is abundant in the gardens of the Horticultural Society, and at the Epsom and other nurseries.

In a border planted with dwarf shrubs alone, placing them two or three feet apart, *P. crassifolius* would make a prominent figure. The pleasing half-trailing manner in which it sends forth its numerous stems, so as to compose a broad and yet dense bush, adapt it for planting by itself in borders, and also fit it for growing in masses. We saw a bed of it in blossom last spring, and the effect was truly splendid.

When propagated, which it can be by cuttings, or by pulling off the shoots which happen to have lain on the earth and rooted, it demands no subsequent culture. A loamy soil, such as exists in most good gardens, will be perfectly suitable, and when the plant is four or five years old, as it is apt to get ragged and shabby in the centre, it should be separated, and the divisions transferred to any desired position. In dividing it, the older portions may be thrown away, and only the younger and more vigorous pieces be transplanted.

A light open situation should always be chosen for it, and it will not thrive in a low wet locality. At all times it loves to have plenty of sun and air.





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Echites atropurpurea?

ECHITES ATROPURPUREA.

(Dark purple-flowered Echites.)

Class
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
APOCYNACEÆ.

Generic Character. — *Calyx* small, five-parted. *Corolla* salver-shaped, with a naked throat and tube; segments of the limb unequal-sided. *Stamens* enclosed; anthers sagittate, cohering by their middle to the stigma, having the hind lobes without pollen. *Ovaria* two. *Style* one, filiform. *Hypogynous scales* five. *Fruit* of two slender follicles.

Specific Character.—*Plant* an evergreen twiner. *Leaves* opposite, petiolate, elliptical, acuminate, entire, smooth, and shining. *Peduncles* axillary, two or more flowered. *Flowers* pedicellate. *Calyx* of five equal subulate segments. *Corolla* with a tube two inches long, slender at bottom, becoming inflated towards the top; segments broadly ovate, rather unequal, acuminate, deep brownish purple. *Stamens* affixed to the tube of the corolla, about half way down.

This pleasing new species was introduced from Brazil by Messrs. Veitch, nurserymen, of Exeter, having been found there, among other things, by these gentlemen's collector. It bloomed for the first time in the month of July last; and we are told that the name under which we now publish it has been applied by Dr. Lindley. It refers to the deep brownish purple hue of the blossoms.

Our subject is a slender climbing or twining plant, apparently like *E. suberecta* in habit, with equally distant foliage, and flowers of about the same dimensions, but of a widely dissimilar hue. Associated with the species we have named, it would hardly be distinguishable from it on a cursory survey, except when in bloom. Then, the contrast of the present flowers with the delicate yellow of those of *E. suberecta* would be exceedingly agreeable.

The blossoms of this plant are borne on long and graceful axillary peduncles, two or more appearing on each. They have a tube nearly two inches in length, expanding, about half way from the base, into a wide throat, which has an ample and spreading limb, an inch and a half across. In the earlier stages of their development, they have a pleasant odour, which enhances the interest of the species.

It was exhibited by Messrs. Veitch at one of the great meetings in the Horticultural Society's gardens, and a Banksian medal was awarded for this and another species, of which we shall shortly give a figure. The dark tint of its flowers seems to contrast finely with the lightness and airiness of its habit.

In cultivation, it requires the temperature of the stove, and may be trained to the rafters of the house, or to a wire trellis spread entirely over the roof. If the branches are intermingled with those of *E. suberecta* and *Stephanotis floribundus*, their flowers will make a very harmonious and delightful combination. The plant may either be kept in a large pot, or planted in a prepared pit or compartment, which is duly exposed to light, and not liable to become too wet. For soil, the ordinary mixture of sandy loam and heath-mould will be appropriate. From the weakness of its shoots, it will need pruning in the winter, and may perhaps be improved by having its branches stopped while they are growing. It is not till after a specimen has been established for two or three years that it acquires the ornamental character which naturally belongs to it, and it then blossoms throughout the summer in the greatest prodigality.

Like *E. suberecta*, it can doubtless be trained on a barrel-shaped trellis. The shoots must, however, be twined very closely, on account of the scantiness of foliage; and if, after they have reached the prescribed height, they are turned back over the previous coils, the trellis will be well covered, and a good display will assuredly be the result.

Cuttings of the young wood root with facility, when treated in the usual way.

GARDENING AS A SCIENCE.

No. IX.

It having been proved that atmospheric air consists of two gases (airs), possessing very opposite and distinct qualities, we must turn our attention to each of those gases, individually. The nature of the union by which they are held together in order to constitute the air we breathe, is suspected to be that of simple *mixture*; it may be so, though we find it difficult to suppose that it is not effected by some powerful attraction. Without, however, dwelling upon a phenomenon which defies complete elucidation, we shall endeavour to investigate the nature of azote.

Azote, or, as it is now generally termed, *nitrogen*, from being the base of nitrous acid, was first pronounced a distinct air, or gas, by Dr. Rutherford in 1792, who called it mephitic air. By Dr. Priestley it was submitted subsequently to minute examination. Its general qualities are thus described by Professor Brande:—"it is a colourless gas, with neither smell nor taste, having no action upon vegetable colours or upon lime-water; neither is it absorbed by water, except that fluid has been deprived of its ordinary portion of air by long boiling, when it takes up about one and a half *per cent.* Its refractive power in regard to light, is to that of atmospheric air, as 1·0340 to 1·0000. It is rather lighter than atmospheric air, compared with which, its specific gravity is 0·976. It is contained in almost every form of animal matter: in the strictest sense of the word, azote is a non-supporter of combustion, for all burning bodies are immediately and perfectly extinguished by it, and its electro-chemical relations are still obscure."

The reader is now in possession of pretty nearly all that is known of its abstract quality, for so far as concerns the inquiries that have been entered into as to its simple or compound nature, they are of no moment whatsoever, being utterly vague and inconclusive.

All that is essential to our present object, is this. If, so far as our knowledge extends, azote is found to be entirely incapable of decomposition, and it be claimed that whatever cannot be analysed or decomposed is *elementary*, then we must admit that *azote is an element.* But if we perceive that when it enters into combination with other bodies or substances it manifestly assumes a liquid or solid form, we may be permitted to hesitate in our opinion. Thus, azote by union with hydrogen produces ammonia, which exists either as a gas, a liquid, or a solid salt. Again, with carbon and iron, it constitutes the dry, pulverulent substance which we call Prussian blue.

Now we claim, that any substance whatever which can assume a variety of forms and conditions, must be, to a greater or less extent *compound*; for to enable it to undergo its several transformations, it must part with some substance or essence, which it had retained in its original gaseous or aërial form.

Presuming then for the sake of argument, and with a view to elucidate our position, that the atmosphere is the repository of azote, of which it constitutes $\frac{4}{5}$ths of the entire volume, it follows that the state in which it thus naturally exists is that of a gas or aërial fluid. But this assumption implies that its particles are infinitely divided, and kept asunder by some powerful, repulsive agent; and therefore, strictly speaking, azote is a *base*, capable of being rarified, and vaporized by some agency, as mercury is by heat.

The ethereal essence, or elementary fire that we term electricity, appears to be the sole agent which can so act upon matter as to reduce it to the condition of a permanent gas, and confer on it the power to attract, and unite with other substances, thereby producing definite new compounds. If this view be correct, azote, and all other gaseous fluids, are highly electrized matters, and all chemical unions which they form and changes which they undergo, are entirely dependent upon electric, mutual attractions; and thus we may infer the compound nature of all gaseous bodies.

But theory apart, the importance of azote in the aërial volume is paramount; for though deadly in itself, yet, when united to its definite and fixed quantity of oxygen, it becomes the principle of life to the animal creation. Again, as the base of nitric acid (whence we derive the nitrates of potassa and soda, so valuable to husbandry) and of ammonia, it is of vast importance to vegetation. All fermenting matters, all animal, and some vegetable substances in a state of putrefaction, pour into the atmosphere a stream of ammoniacal gas, which being for a time diffused throughout it, is conveyed to the earth by mists and rain, and thus fertilizes the ground.

The question of the primary formation of ammonia is dark, but the phenomenon must be electrical, for the quantities of the two gases, azote and hydrogen, required to form ammonia, occupy twice the volume of a similar quantity, by weight, of ammoniacal gas.

Hydrogen gas is always present in the atmosphere, owing to the decomposition of water. When therefore a chemical union of azote and hydrogen is therein effected by atmospheric electricity, the gases become condensed into half their original volume, proving that the electricities of each have combined and neutralized each other to a given extent.

In our laboratories we can effect the converse of this natural experiment, by the decomposition of ammoniacal gas, thereby doubling its volume by the separation of the elements; but we fail to produce ammonia by the union of those elements. Nature, however, is sufficient to the work—hence, the peculiar softness of rain water, and the extremely fertilizing qualities which it possesses.

Oxygen.—Of this substance we are virtually ignorant, though its name is familiar to every one. It was certainly discovered by Dr. Priestley, on the

1st of August, 1774, and by him denominated dephlogisticated air. It is somewhat heavier than common air, for 100 cubic inches weigh about 34¼ grains; whereas, an equal quantity of air weighs 31 grains. Hence, the lightness of azote is compensated by the greater weight of oxygen; and the advocates for the simple mixture of the two constituents of common air acquire an argument in support of their hypothesis.

Oxygen exists in common air, as a gas, to the extent, as we have stated, of about one-fifth of its entire volume; it also combines with the metals and assumes the solid form; it unites also with almost all substances in nature; but its grand magazine is water. The mind is overwhelmed when it reflects that oxygen, in the condition of a liquid, constitutes by weight eight parts of nine of the entire volume of all the waters of the vast ocean and its tributary rivers.

When a stream of electricity is made to pass through water, a quantity of the purest oxygen is developed, and the experiment involves all the wonderful phenomena of galvanism, or more correctly speaking, of voltaic electricity. We refer the inquiring reader more particularly to Dr. Faraday's new Researches in Electricity. But in this decomposition of water, the oxygen is produced in the form of an air or gas, which occupies a volume very much more extensive than that of the water; for whereas, 100 cubic inches of oxygen weigh only 34 grains, one single cubic inch of water is found to weigh 252½ grains! Herein we perceive one of the most powerful arguments in support of the electric condition of gaseous bodies; for if one single grain of oxygen gas occupies a space equal to many thousand times that of fluid water, it follows that the electricity which has separated the constituents, must have combined with them during the process of decomposition.

Oxygen gas, therefore, may be viewed as a combination of a certain base with a definite quantity of elementary fire; it, therefore, is no longer to be regarded as a simple body.

All the grand meteorological phenomena of nature may, therefore, be referred to the electrolysation of water, and the alternating recomposition of its elements.

In this point of view, how wonderful are all the operations of nutrition and growth! One plant shall be seen to produce large and succulent leaves, the juices of which are insipid and watery; another abounds with milky and resinous fluids, a third with highly odorous perfumes; yet all these various conditions are mainly dependent upon one of the gases of the atmosphere,—oxygen,—derived in this instance from water, which fluid, if duly supplied, retains each plant in luxuriant verdure. Other inquiries, however, claim our attention, ere we can arrive at any correct opinion of the assimilation of water by the laborating powers of the vegetable organization.

ON PLANTING SHRUBS IN BEDS.

Although, in the management of the flower-garden, the old system of having as great a variety of plants as possible in every bed is now generally abandoned, and each plot is commonly filled with one species or variety, there is too little indication manifested to extend the practice to pleasure-grounds, and to bring beneath it the many beautiful shrubs with which our gardens abound. Ornamental shrubs, indeed, with the exception of a few detached specimens, are still usually employed along the margins of plantations alone, or, as in the cases of Roses, Heaths, &c., set apart in a small garden by themselves.

It is to rectify this want of appreciation of their capacity for grouping, and to specify those which are best adapted for the purpose, that we publish the following remarks. The large amount of interest that is lost to a place by the neglect of the plan herein spoken of, is incalculable by those who have never seen the fine effect which scattered masses of shrubs at all times produce. We would not argue that they are preferable to single plants, because both are exceedingly useful to give a diversity of surface; but, at all seasons, it is certain that the former must have a more imposing and effective appearance. We shall treat, separately, of the situation in which they should be placed, the form and composition of the beds, the nature of the plants suited for being thus arranged, and their preparation and treatment.

Of the position proper for groups of shrubs, we have said something in our last Number, (p. 182,) at which the reader may just cast a glance as he proceeds. Flower-gardens are ordinarily considered the most appropriate for fronting or surrounding mansions, as they can be adapted, in their forms, to the style of the building, and are the most highly-finished and decorated objects which the garden contains, thus harmonizing with the polished and artificial character of the building. They are, moreever, the lowest or dwarfest species of ornament which can be used, and cannot by any possibility obstruct the vision from even the bottom windows of the house. Beyond the flower-garden, trees are often introduced, indiscriminately, either singly or in masses, and there is no regular gradation from the one to the other, and nothing of an intermediate nature to break the abruptness of the transition. Sometimes large groups, composed of a mixture of shrubs and flowers, are made use of, and these are desirable in limited proportions. Yet, between them and the flower-gardens, there is room left for planting a few beds of low shrubs exclusively, and beyond their intrinsic agreeableness, they would please by forming a step in the passage from the humbler to the higher orders of vegetation.

We have thus assumed that the plants which adorn the lawns in the neighbourhood of mansions should rise in height, as they reach a greater distance from the edifice, till they blend with the taller trees of the remote pleasure-grounds or park. And in affirming this as a general principle, we do not mean that it is fitted for effectuation in all places, or that it shall be too scrupulously carried out. There are mansions so closely environed by trees, that a flower-garden, or groups of small shrubs, in their vicinage, would be ridiculous, and must be dispensed with. The majority, however, have at least one front on which the system can be practised; and there we would plant out masses of shrubs so as to come in between the flower-gardens and the larger shrubberies or trees.

That we have no intention of making such a graduated slope from the house in any degree formal, will have been gathered from our former articles on an allied subject. Nothing could be more detestable than a monotonous bank, in which the plants simply rose one above another, as they receded to the extreme boundary. And we need scarcely say that we do not advocate such an aspect, further than relates to the mere outline. The great art in making such slopes is to preserve their desired character, and, at the same time, to render the surface of the plants composing them thoroughly broken and irregular. This can be done by intermingling masses of shrubs with individual specimens, and putting in, occasionally, rather larger plants than appears really necessary. The object of the whole method will be readily seen. By having the plants so arranged as to rise gradually higher and higher till the greatest altitude is attained, there will be no violence of change, no incongruity, but a seeming naturalness, and a facility for the eye to travel over all the objects within a wide range of vision.

Another place in which plots of shrubs might be appropriately planted, is in the front of those minor buildings which are mostly to be met with in gardens of moderate size. Detached conservatories, ranges, or groups of them, temples, summer-houses, and other like erections, are frequently so far isolated as to need the ground facing them to be laid out in a peculiar and accordant manner. They are, at times, thrown forward in the pleasure-grounds in such a way that they do not require more than an open space of lawn in the front. In additional instances (especially with reference to conservatories) they are so completely separated and shut in that nothing but a decided flower-garden will suit their character. More commonly, however, they exist in a state intermediate between the two just mentioned, and are partially secluded, while they are to some extent exposed. The spot connected with them has, therefore, to be treated differently from either of the above methods. A flower-garden would rarely be in character, because it would tend to destroy the unity of the pleasure-grounds, and supply a highly-dressed feature in a rather anomalous position. And the subordinate buildings in a garden are seldom of sufficient importance to warrant their being treated as the mansion itself. An unvaried glade of turf, again, would be disagreeable, since the structure would then stand unconnected with the garden, and have an air of unfitness and superfluity. The adoption of a medium course, by inserting a greater or less number of beds of shrubs on the turf, would, consequently, be the wiser and more tasteful proceeding; and here we have an excellent position for the subjects of our paper.

In many domains, moreover, there are parts of the pleasure-grounds, at some distance from the house, which may be described as retired dells, surrounded on several or on all sides with trees, that afford both shade and shelter, and having banks which slope in a varying manner into a narrow hollow along the centre. Or the ground may not constitute one continuous hollow, but have all kinds of irregular undulations. The ease with which such a spot may be made where it does not naturally occur, renders us more confident when we say that if judiciously treated, it is one of the finest portions of a pleasure-garden during summer. Its retirement, its coolness, and the luxuriance and beauty of the vegetation within it, impart to it peculiar charms. We must merely state that the ground should be covered with turf, and that the clumps of shrubs should be distributed, without order, over the banks or slopes.

By the sides of walks, again, which surround pleasure-grounds, or proceed along any part of their extremities, whether they conduct to particular prospects, or have openings at their sides to embrace desirable views, or are simply for shady retirement, or for exercise, the strip of lawn which accompanies them is widened, in places, for variety, and may here and there be expanded sufficiently to allow of two or three beds of shrubs being planted upon it. Assuming that the walks are outlying ones, and carried through shrubberies or woods, flowers would be out of place there, and single shrubs or trees would, by their frequency, become monotonous. Some masses of shrubs, therefore, occurring at various open intervals, would greatly enliven and beautify such walks.

Ere we leave this part of our essay, it seems requisite to observe that beds of shrubs always look best when situated on an open lawn, or separated by patches of grass, than when in any way associated with gravel-walks. Groups of flowers may occasionally be shown more advantageously by contrast with the gravel-paths by which they are traversed; though, in that case, the definitiveness of their outline is maintained by a box or other edging, and they never extend beyond this. In regard to shrubs, one of their most interesting features is to spread beyond the boundary of the bed in which they are grown, and it is neither natural nor gratifying to see their branches lying on gravel. On the contrary, when their shoots are extended on turf, they have the most characteristic and delightful aspect, and if they are not of that nature by which they will cover the earth in the beds, the grass relieves the dulness of the visible portion of soil, and also the blankness of deciduous shrubs in winter, far better than any sort of gravel. From every consideration, then, there should be no paths, unless they be turf ones, in connexion with groups of shrubs.

Of the shape of beds in which shrubs may be grown, it is needless to advance much. Simple figures are, unquestionably, the most applicable, but there ought to be considerable variety in them. Eminent gardeners have frequently confounded the inherent beauty of a figure with its appearance when planted. These may be and are materially different. The circle, for example, is undeniably one of the most beautiful of things in its contour; and hence it has been thought that a garden composed of circular beds, of every diversity of diameter, would be a concentration of all that is elegant in form. But a circle, abstractedly viewed, and an aggregation of circular plots filled with plants, are essentially distinct. When the bed is to be walked round, no figure can equal the circle. In such circumstances, it assimilates to its appearance on paper. An idea of indefiniteness, symmetry, and perfection is gained at all points. And a circle is singularly fitted for forming the centre of a garden, without regard to the size or the distance of the groups around it. It is likewise excellent where a series of regular beds exist on one or both sides of a principal walk; because, by passing along the walk, the spectator has an opportunity of examining the beauty of each bed at a glance, and from either end they produce a like effect to pillars in a colonnade, or the boles of trees in an avenue. Being round, it is much easier for the eye to pass along them, while, simultaneously, the apparent length of the walk is greatly increased.

Where beds, however, are scattered over a lawn, they are not to be viewed individually but collectively, and not from all sides, but from a limited number of principal points. Their aspect, too, ought to be as varied and irregular as art can make it; and all formality, except in a geometrical garden, is to be abjured. With such objects, round groups will never comport. Their very nature should restrict their use to places where symmetry and uniformity are sought; and if confined to the localities we have indicated, to flower-gardens, and to the middle of particular plots, they will be admired. Beyond that, the tasteful would discard them.

To supply positive rules respecting the best shape of beds for shrubs, would be nearly impracticable. We can only say, as we have before hinted, that all acute or salient angles should be avoided, and that in other matters the locality itself must determine the figure. On a flat and expansive lawn, beds of the most varied and irregular form will be proper; and they will generally be improved in appearance by being a little elevated in the centre. Such a provision, whatever be their dimensions, will prevent them from looking tame and flat; and if the larger specimens are put on the highest ground, a still further diversity will be realized.

For making beds to contain any specified kind of shrub, the character and habits of that plant must obviously be consulted, as regards the soil with which it shall be furnished. Few localities happen to be composed of earth suitable for the plants to be placed upon them; and where so rare a condition is found, further preparation is necessary. It will, in most cases, be needful to remove the soil entirely, and introduce a fresh compost, prepared for the purpose. And supposing the existing earth to be actually appropriate, it is of the first importance that it be efficiently drained; to effect which, it will have to be removed to the depth of eighteen inches or two feet.

A practice is prevalent in taking out earth to form a new bed for choice plants, and in making pits in which to plant shrubs or trees, which may here be alluded to and deprecated. It is that of sloping the sides of the excavation inwards, under the surrounding earth, so as to leave the edges impending over the cavity. By this mode it is fancied that more new earth can be inserted for the use of the roots, without the trouble of removing so much of the surface soil. The result is, however, that when the roots get into such parts, the earth immediately above them is different from that in which they are growing, and not so readily penetrated by air, nor alike free in regard to drainage. Water is therefore almost sure to accumulate and to stagnate there, and the very best roots of the plant often suffer in consequence. The preferable plan is to let the sides of the excavation slope towards (not from) its centre; thus having a greater quantity of better earth near the surface, in order to attract the roots to remain there.

After the earth is taken out where a bed is to be formed, a layer of broken bricks or stones should be put into the bottom of the hole, to the depth of at least six inches. This will serve to keep the soil duly drained, and will also prove a check to the roots in their downward progress, stopping them from proceeding into the substratum.

On the last-named condition, an immense deal depends; and it involves one of the highest principles in modern gardening. By attention to it, the plants are kept a trifle more stunted, their hardihood is immeasurably increased, and they are enabled to bear a more striking profusion of flowers. We were lately astonished to witness, in a district two degrees north of London, a large quantity of the common Furze, (*Ulex europæus*) which had not been injured by the sharp winter of 1837—8; when, as is universally known, all in the vicinity of London was killed down to the ground. The cause of its preservation, we were told, was to be found in the extreme shallowness of the earth, its containing an abundance of of stone and reduced rock, and lying on a rocky sub-layer. The growth of the Furze was, on these accounts, comparatively small each year, but it was exceedingly well ripened, and intensely hardy.

Besides putting a thick layer of drainage at the bottom, it is advisable to raise the earth in the beds a little above the ordinary level, as well for appearance, as for still further facilitating the escape of water from the roots. Concerning the compost, it must, of course, be varied according to the nature of the plants. We would nevertheless recommend that an earth only slightly more nutritive than that in which the plant naturally thrives be selected. It is an error to place any flower or ornamental plant in a soil that is really rich, since such a condition would invariably excite it to grow too rapidly and luxuriantly, thereby decreasing the number of blossoms, and making the specimens considerably more susceptible of detriment from cold.

Rhododendrons, and what are termed American plants, are supposed to require peat or heath-soil, and if they are supplied with this, their success is securely calculated upon, in whatever situation they may be planted. There is much of mistake here. If grown in low shaded dells, such as have already been described, heath-mould is certainly the most congenial, for nothing can be more magnificent than the American plants at Mr. Waterer's nursery, Knapp Hill, where the bog-earth is yet from ten to twelve feet deep in some spots. The extraordinary luxuriance and fertility there attained, are, however, in part due to the lowness and comparative swampiness of the situation. The earth is perpetually filled with moisture, and, as an indication of the dampness of the atmosphere, most of the stems and branches of the plants were loaded with Mosses and Lichens.

If it be presumed that an American plant will flourish as well with heath-soil, in a high, dry, and exposed situation, one or two experiments will soon convince of the contrary. Without the assistance of artificial watering, it would perish in hot summers; and where the tribe is necessarily planted in such positions, they ought to have a strong loam mixed with the earth, to render it sufficiently retentive of water. We conclude, then, that these plants love to grow in heath-mould, seeing that they are most healthy in it, when other circumstances are favourable: but that they should have with it, a low, somewhat moist, sheltered, and triflingly shaded locality, or, wanting these conditions, be planted in a more nutritious and retentive earth.

The following Number will contain the completion of this paper.

THE PRESERVATION OF HALF-HARDY PLANTS THROUGH THE WINTER.

Instances must have occurred to most people's experience, in which a few trite suggestions, timely given, have been of more value than hints whose intrinsic worth was infinitely greater, but which have been thrown out unseasonably. Perhaps, therefore, the remarks we are about to offer, though possessing but a small amount of novelty, will be useful to some of our readers on account of their appearing at a time when information of the sort is just beginning to be needed.

The large demand for half-hardy plants in the present day, and their almost exclusive employment in the decoration of flower-gardens and parts of pleasure grounds, has elevated them into an importance which they only before had as greenhouse objects. And now that they are found to grow so well in the open ground during summer, immense quantities of them are cultivated for that purpose. Their summer tendance is, of course, very trifling, and it is the keeping them through the winter which alone occasions trouble and demands skill.

There are numerous ways of managing them, each pursued in reference to the conveniences of the cultivator. Where pits and frames are abundant, and labour is not very highly estimated, young plants are struck from cuttings, throughout the autumn, in sufficient quantities to admit of some perishing, and yet of there being enough for summer purposes. This is the most expensive and extravagant mode; as, in a place of tolerable extent, having many flower-beds to fill, it will require a very considerable space in pits or frames to preserve an adequate supply.

Others raise in autumn, by the same means, about a third or fourth of the plants they are likely to need, and propagate the rest from those in early spring, by cutting off and striking the younger shoots. The plants produced in the latter way are not, it is true, quite so strong as the autumn-raised specimens, but they are sometimes more healthy, and always, if taken off in good time, become excellent little specimens ere it is time to plant them out. The stock from which the cuttings are prepared, are, moreover, in no degree injured by the pruning; for it would have to be effected by the prudent gardener, if the cuttings were not thus employed. As will be perceived, this is altogether a more economical and better plan than the preceding, so much less winter room being requisite.

Some culturists, again, take up a few of the more healthy roots of each variety from the ground, reduce and pot them, and keep these in a greenhouse or frame through the winter to be multiplied in spring. By this system a still less amount of space is necessary in winter, and the plants are often put in the corner of a greenhouse. They have, however, to be a little excited, by a trifling bottom-heat, in spring, in order to induce them to send forth their branches in due abundance. The plants obtained from them are, consequently, hardly so healthy as those procured in either of the foregoing ways, and there is generally some risk of losing or greatly weakening plants that are potted in a small compass after ranging at full liberty in a free earth.

More economical persons take up the roots in a similar manner, pot them in a smaller compass, cut off most of the branches, gradually bring the plants into a torpid state, and place them, for the winter, in a cool dry cellar, or other dark apartment, away from frost or damp, or anything that could either kill them or stimulate them to grow. They are brought from their confinement early in the season, put in a gentle hotbed frame, and propagated from the shoots they will then produce. There is more danger of losing the plants by this method, the spring growth is not so favourable, and the young plants are therefore inferior; while the saving of trouble and room is not proportioned to the contingent or certain evils.

The plan which we have once or twice seen followed, which appears to combine economy of space with the attainment of healthiness in the plants, and which we cordially recommend as superior to any other we have met with, consists in striking a great quantity of cuttings during autumn, and retaining them in the cutting pots, without shifting, till spring. This does away with the necessity for spring propagation, the plants procured by which are inevitably weaker than those which have been rooted all the winter; and it also renders very little room necessary for the preservation of the stock.

To carry out the above plan, the cuttings should have been put in about the middle of last month, though it is not now too late to do so. They should be planted in shallow pots, deeper than what are called "flats," but shallower than the pots ordinarily used. They ought not to be more than from four to five inches across, as larger ones would endanger the cuttings that happen to be in the middle. After carefully providing them with ample drainage, they must be filled with a very light compost of sandy loam and heath-mould; the last preponderating, and being assisted by the addition of some white sand. It is indispensable that the soil be thus open; as whatever retains water too freely will be sure to destroy the plants. Even a few small pieces of broken sandstone mixed with the earth will be extremely serviceable.

Let the cuttings be placed an inch and a half or two inches apart, according to their size and nature, and be very sparingly watered after being inserted. It is injudicious to give much water to newly-planted cuttings, particularly when the soil itself is moist. If they are to be struck in September, they may be placed in a cold frame, which can be kept closed and shaded. The natural heat of the sun will soon enable them to form roots. In the event, however, of their having to be raised after this appears in print, they can be assisted with a very moderate bottom-heat. Any nearly exhausted pit or hotbed will be sufficient; for the most trifling aid is all that is desirable. When it is seen, by their progress, that they have developed roots, they should be forthwith transferred to a colder frame, and hardened, in every practicable way, before winter arrives. Water must now be administered cautiously, and so as not to incite them to further growth. And if the young shoots they have made are too long or too weak, and there is thought to be time enough for the wood to heal ere the commencement of severe weather, they should by all means be stopped. Decaying leaves, and the slightest symptoms of mouldiness, must be constantly attended to and removed; because, by being so close to each other, the young plants are exceedingly liable to be injured, if neglected.

Towards the middle or end of March, or the beginning of April, (the precise time being determined by the forwardness of the season,) the plants can be taken from the cutting pots, and potted separately into smaller ones. Room will not, at this period, be of so much moment, as it will not involve the daily coverings, &c., so needful in winter. The plants cannot be kept too cold, if they are not frozen. Some persons, we believe, retain the plants in the cutting-pots almost or quite up to the time of transplantation. Where space cannot possibly be procured for standing them when potted, the practice may be tolerated. The stock must, however, suffer greatly, and will be a far longer time ere it makes any display in the borders.

In the winter preservation of tender plants, the choice and preparation of frames or pits is of some importance. A dry position, elevated above the surrounding level, is essential; and the yard or garden appropriated to frames ought to be particularly open, airy, and well-drained. For the convenience of making hotbeds beneath or around them, frames are often placed in a hole or excavation below the general surface, and are thus perpetually damp, and surrounded with the partial drainings of the yard. Instead of this, they ought to be raised above the yard, and have a firm, hard surface beneath them, so that no undue moisture can soak into it, and arise through it.

Potted plants, that are kept in frames, are commonly placed on coal ashes, which supply a dry surface, and through which worms will rarely pass. Any of the various kinds of cheap composition, in the form of asphalte, may now be employed, and will constitute a harder and drier floor.

As an excellent mode of obviating injurious dampness, and sustaining the plants in a healthy condition, we have had recommended to us the use of slaked lime. It is spread over the floor of the frame to the depth of three inches, and the pots are slightly plunged in it. It is said to be an admirable preservative against mouldiness, and exceedingly useful to tender plants.

For protecting frames containing tender plants, a variety of materials may be taken. Especial care should be exercised that no cold air enter from below; and if the frame be raised, as we have advised, the space between its base and the ground, and all its sides likewise, should be closely banked up with thick pieces of turf, so as to render it quite secure at all points. It is not alone through the glass, in very sharp weather, that heat is abstracted. Radiation will be going on, if not checked, from every portion of exposed surface. During protracted and intense frosts, we have seen frames advantageously covered with unfermented leaves, to the thickness of three or four inches. All such exclusion of light must be accompanied with comparative drought, and very slight waterings should ever be made when frost threatens. At every favourable interval, too, light ought to be admitted, and when practicable, if the atmosphere be sufficiently dry, air should be introduced, as well to change the supply, as to carry off moisture.

In the beginning of the winter, it is of primary moment that the plants should be kept as dormant, healthy, dry, and hardy as circumstances will allow; because, during the remainder of this period, their condition will depend much upon that of the earlier stages. Superfluous kindness will do them more harm than neglect, provided the latter be not too gross. They should have copious daily supplies of air, and be left uncovered as long as it is at all safe.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR SEPTEMBER.

Bego'nia hydrocotylifo'lia. "One of the many pretty Begonias with which our stoves have been enriched, through the liberality of the Royal Botanic Garden of Berlin." It has thick, creeping stems, which are covered with large scales, and the leaves rise numerously to the height of about two inches. They are nearly round, equal-sided, cordate, and convex on the upper surface, resembling in figure those of the common *Hydrocotyle*. The flowers rise on peduncles from eight inches to a foot high, and are in panicles. They are abundant, and their colour is a deep rose. The species blossoms in the summer season. *Bot. Mag.* 3968.

Bro'wnea cocci'nea. "Few things can exceed the elegance or the richness of colouring in the beautiful flowers of this shrub; but unfortunately they are rarely produced in our stoves, and very quickly drop, scarcely lasting more than twenty-four hours. The specimen described produced several fasciculi in short succession, in February 1842, in the Botanical Garden, Edinburgh. It is a native of Jamaica, and was introduced to our gardens so long ago as 1793, by Admiral Blyth, but has never been recorded as having flowered till now." The leaves are long and pinnate, being green on both sides. The flowers are in large hive-shaped clusters, pendulous, and of a brilliant vermilion rose-colour, with scales to the flower-buds of a similar hue. *Bot. Mag.* 3964.

Ce'reus speciosi'ssimus, *var.* Dr. Lindley proposes substituting for the Latin title of this plant the term "Shew-Cereus," on account of its being, first, "nearly a translation of the Latin, and secondly characteristic of the purpose to which this beautiful species is so generally applied." The variety figured has smaller flowers, but in other respects is exactly like the original, having the same inimitable blue tint in the blossoms. It was sent up by Mr. Scott, gardener to Charles Barclay, Esq., of Bury Hill, near Dorking, as the species called *Cereus coccineus.* It differs essentially from that plant, however, and ranks beneath *C. speciosissimus,* as a "distinct and pretty variety, worth cultivation." *Bot. Reg.* 49.

Epide'ndrum lancifo'lium. Exceedingly like *E. cochleatum,* from which it can hardly be distinguished. "It is, however," says Dr. Lindley, "readily known, by its regularly ovate, sharp-pointed lip, which is streaked with deep purple radiating lines upon a pale yellow ground." The pseudo-bulb seems somewhat longer and stouter than that of *E. cochleatum,* and rather more of an oblong figure. The leaves also are lance-shaped. In the flowers, the sepals and petals are of a dull pale yellow, slightly tinged with green, and they are borne exactly as those of *E. cochleatum.* "It should be kept in a cool stove, along with other plants of like habits, many of which have been lately imported from the high land of Mexico and Guatemala." *Bot. Reg.* 50.

Gera'nium eria'nthum. "A robust, hardy perennial, of easy culture, growing from one to two feet high, in any good garden-soil. It flowers freely during the months of June and July, and is easily increased by dividing the old plant when in a state of rest, or by seeds; the seeds should be sown directly they are ripe, and then they will flower the following season. It was raised in the garden of the Horticultural Society, from seeds received from the late Mr. Moreton Dyer, from North West America." The leaves are palmate, with five to seven deeply laciniated lobes, and pubescent. The flowers are large, and of a reddish crimson colour. *Bot. Reg.* 52.

Illi'cium religio'sum. Brought over by Dr. Siebold from Japan, where the people regard it with great reverence, and "strew wreaths of it and branches over the tombs of their friends, and the priests burn the bark as a perfume upon the altars of their deities. A singular use is made of the pulverized bark by the public watchmen. Hollow tubes, graduated on the outside, are filled with this substance, which is lighted at one extremity, and burns gradually and uniformly; so that when the fire has reached a certain mark, the watchmen strike the hour upon a bell, and thus announce it to the public." The plant is a handsome evergreen shrub, with shining elliptical leaves, and great numbers of yellowish green blossoms, which are destitute of fragrance It flowered in the greenhouse of the Royal Botanic Garden at Kew in the month of March. *Bot. Mag.* 3965.

Maxilla'ria acutipe'tala. "Allied, on the one hand, to *M. tenuifolia,* and, on the other, to *M. picta,* but abundantly distinct from both." The pseudo-bulbs are larger than those of the former species, and differently arranged, while the leaves are broadly linear, and exceedingly dissimilar. The sepals and petals of the flowers are bright yellow, richly spotted with brownish red, and the lip is of the same hue. The extremities of the sepals and petals are particularly pointed, whence the name. Two blossoms are sometimes produced on the same stalk, but they are mostly single. "It was sent to the Royal Gardens at Kew by Mr. Barclay, their collector, in H. M. Surveying ship the Sulphur, from Central America, and I am not aware," adds Sir W. J. Hooker, "of its being in any other collection. It flowers in March and April, and the very prettily marked blossoms render it a desirable plant in every Orchidaceous stove." *Bot. Mag.* 3966.

Onci'dium urophy'llum. "This is really a charming species of *Oncidium,* with quite a peculiar habit. Its leaves are shaped like a penknife curved backwards, so at to have the edge on the convex side. This is caused by the two sides of the leaf being brought into contact, and their growing together, the back of the knife-shaped leaf consisting of their edges. From this structure to the rush-leaved species, such as *O. Cebolleta*, is but a step." The species so formed constitute a distinct section of the genus, including, besides *O. urophyllum*, *O. pulchellum*, *triquetrum*, *iridifolium*, and two others. " That now figured has a graceful drooping panicle, four feet long, of clear yellow flowers, almost white at the back, and with a few crimson stains near the centre on the upper side. It was imported from Brazil by Messrs. Loddiges, and flowered with them in March 1841." *Bot. Reg.* 54.

Otho′nna frute′scens. " A handsome and showy plant, a native of South Africa, with a stout stem, singularly glaucous and fleshy leaves, and copious handsome yellow flowers. It was grown in the Dutch gardens in the days of Commelinus, (nearly two hundred years ago,) but does not appear to have been cultivated in England till now, when we find it in the Birmingham Botanic Garden. It is a greenhouse plant, and flowers during the latter end of summer." The stem grows two or three feet in height and is suffruticose, and the flowers are very profuse, syngenesious, and rather coarse. *Bot. Mag.* 3967.

Pharbi`tis ostri`na. " Referred to the genus *Pharbitis*, on account of its three-celled ovary, with two ovules in each cell, but it has all the habit of a *Batatas*. It is a very beautiful climber ; obtained last year by Messrs. Loddiges from Cuba. The roots are large and tuberous ; the stem perishing every winter, but growing out rapidly in the spring to the length of twenty feet or more, and producing an abundance of blossoms." The leaves are three-lobed, and the peduncles bear from three to four flowers, which are not large, but of the finest purple hue. " All these fleshy-rooted Bines are of the easiest culture. They should be grown in a mixture of good sandy loam and leaf-mould, to which may be added a small portion of sandy peat if the loam is strong." *Bot. Reg.* 51.

Plant's Anisanth. " This beautiful plant is a mule obtained by Mr. Plant, Nurseryman, Cheadle, from whom specimens were received in September 1841, with the following note :—' It originated here, and bloomed for the first time in 1838. It is the produce of seed from *Anisanthus splendens* and *Gladiolus Colvillii*, the latter, as you know, itself an hybrid. The present one is, as far as my humble abilities will allow me to judge, exactly intermediate betwixt the two parents ; the bulb is also intermediate, being entirely wanting in that peculiar mode of increase which obtains in *Anisanthus splendens*—I mean by means of tubers, or in the manner of Potatoes—a fact which Sweet has taken no notice of in establishing the genus *Anisanthus*. In the practice of hybridizing we know but little yet. Would you believe that I have some seedlings between *Gladiolus* and *Amaryllis*? I have this day taken the roots up, some of which present a most curious appearance ; neither bulbs nor scales, but something of both.' " After these facts, the doctrine that species of different genera will not unite their properties must be wholly abandoned. *Bot. Reg.* 53.

NEW OR INTERESTING PLANTS RECENTLY IN FLOWER AT THE PRINCIPAL SUBURBAN NURSERIES.

Ae′rides quinquevu′lnerum. This noble and lovely plant flowered splendidly with Messrs. Loddiges last month, bearing two or three racemes more than a foot in length, and branching in several places. The tendency of the racemes to branch is a novel characteristic, and the rich markings of the blossoms, as well as their exquisite odour, render it one of the most attractive of the tribe.

Aristolo`chia hyperbo`rea. When well cultivated, this is really an extremely fine plant, both with respect to its foliage and flowers. It is grown in the Orchidaceous house at Messrs. Rollisson's, Tooting, and trained over the roof as a shade to the plants. Being itself in a light position, and planted out in a tolerably rich earth which is not overshadowed by other plants, it thrives with peculiar vigour, and has lately produced a considerable number of its extraordinary blossoms. These were at least eight or nine inches in length, of a strange figure, and beautifully streaked and blotched with deep blood-colour on a dull whitish-brown ground. Its scent is by no means agreeable, though it is not powerful except in a confined house.

Aspa`sia ——— ? An evidently new species of *Aspasia* has flowered in the nursery of Messrs. Rollisson, Tooting. It has flattish, thin, but not remarkable pseudo-bulbs, somewhat like those of Brassias, only smaller. The flowers are at present solitary, with narrow spotted sepals and petals, and a large white lip, which is purplish in the centre.

Bra'ssia verruco'sa. The great peculiarity of this interesting plant is the strange wart-like elevations on the lip of its flowers. These are both frequent, and scattered over a large part of the surface. In other features, it is a good deal like the commoner species, and has yellowish-green blossoms, mottled with dark brown. Messrs. Rollisson flowered it last month.

Bravo'a geminiflo'ra. A novel bulbous plant, which has freely unfolded its flowers in a greenhouse at Messrs. Loddiges', and at other places. It has long taper channelled leaves, and tall flower-spikes. The blossoms appear in pairs, and individually curve downwards in an unusual manner. They are of a bright-red hue, delicately tinged with purple, and exceedingly pretty.

Cala'nthe Masu'ca. The present name has been applied by Dr. Lindley to a very fine species, which has been imported from the North of India, and bloomed for two or three months, commencing at the end of May, in Messrs. Rollisson's Orchidaceous house. The flowers are its chief distinguishing traits ; and they are borne on a short strong spike, closely together, being of a deep pink tint, with a much darker heart-shaped labellum. They are very handsome.

Cycno'ches macula'tum. Messrs. Loddiges have just bloomed this most elegant species of the genus in extreme profusion. The flowers are not nearly so large as those of the other species. They are, however, more abundant, occurring in very long graceful racemes, and have a great number of spottings, which give them a lively aspect. They are also smaller and with narrower divisions than those of *C. Loddigesii* and its allies.

Cycno'ches ventrico'sum. We notice this species for the purpose of calling attention to its delightful fragrance, which actually loads the air of the house where it is blooming. Messrs. Loddiges have flowering plants of it, and the blossoms are of the same hue as those of *C. chlorochilum*, but of very much less dimensions.

Jasmi'num Ree'vesii. Under this title, a very neat Chinese Jasmine exists at Mr. Knight's, Chelsea, and has flourished in the open air for several years. It is an evergreen half-climbing shrub, with pretty pinnate shining leaves, and showy yellow blossoms. It is altogether better, in habit and foliage, than *J. Wallichii.*

Li'lium testa'ceum. Another of the noble Lilies which were brought by Dr. Siebold from Japan. It has large five-nerved leaves, and especially fine flowers, which are whitish, but tinted on the outside with a shining purple. Altogether, it ranks among the best of the race, and has been flowered by Messrs. Rollisson, Tooting.

Lo'tus cornicula'tus, flo're-ple'no. A very interesting variety of the pleasing little plant that is found so copiously on our commons and pastures. It is a dense-growing trailer, admirably suited for adorning rockwork or narrow elevated borders, and bears double yellow blossoms in the greatest liberality.

Ma'lva lateri'tia. For planting in flower-beds and borders during the summer, this will doubtless prove a useful species. It has almost undivided crenate leaves, and light-coloured blossoms, which approach nearer to a pinkish yellow than to red, but which may, possibly, vary with circumstances. They are said to be exceedingly numerous, and are very beautiful. The plant is blossoming in the open ground at Messrs. Henderson's, Pine-apple Place, and is considered half-hardy and suffruticose.

OPERATIONS FOR OCTOBER.

By the time this Magazine is before the public, it is probable that frosts will have occurred in most parts of the country ; or, if they have not yet been experienced, they may confidently be expected in a few days. Tender plants of all sorts, therefore, that are intended to be stored, ought to be immediately transferred to the greenhouses or frames.

There will be, however, a number of species, such as Brugmansias, Salvias, large specimens of Pelargoniums, &c., for which there will be no room in the houses, and which cannot be easily protected in the open ground, but which it may yet be desirable to retain. If these are taken up, their branches cut in to within a short distance of the stem, and their roots greatly reduced ; then potted, and placed in a back shed, where they can have light and air till the frost sets in ; they may afterwards be covered up there or in a dry cellar for the winter with impunity.

In removing these and all exotic plants from the ground for the winter, their superfluous roots should not be broken or hacked off with the spade, or cut carelessly with any instrument. Crushed and mangled roots invariably rot, and spread the decay to other parts. It is proper, consequently, that they should be removed cleanly and skilfully with a sharp knife. Indeed, it is more necessary to prune the roots with care than the branches, and every one acknowledges the importance of attention in the latter case.

Dahlias, Marvel of Peru, and other exotics with similar roots, need not be taken up, or have their stems removed, directly these are damaged by frost. Sometimes a casual frost cuts off the tender foliage for several weeks prior to the commencement of the actual winter season, and the roots would be much benefited by remaining in the ground this time. If the stems be early injured, then a mulching of old bark should be placed round their base, and unless the weather be excessively wet, they may be left another fortnight, or till serious frosts ensue. When practicable, they should be taken up in dry weather, that their tubers may not be saturated with moisture. When they are extremely wet, they should be dried a little before being put away for the winter.

The rooted layers of all half-hardy plants that have been propagated in this way, must at once be potted, if they have not heretofore been attended to. Specimens that are to be housed for supplying cuttings in spring, ought no longer to remain exposed. It will be beneficial to them to have all their outside shoots, as well as many of their roots, trimmed off, since they will the sooner produce a greater quantity of laterals, when excited towards the spring. They will thus, likewise, occupy less room in the houses.

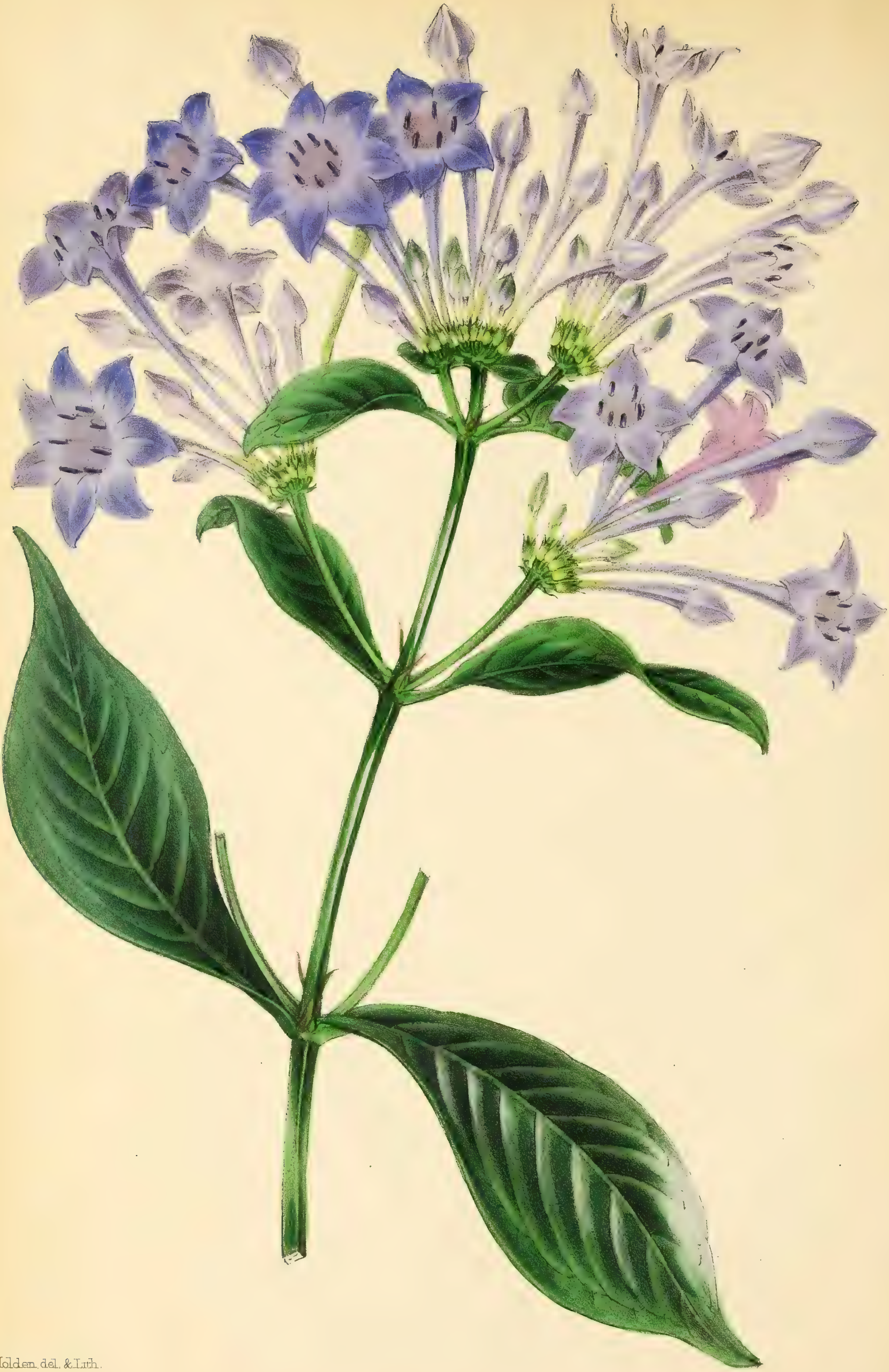
Half-hardy stock, or young plants growing singly in small pots, or remaining in the cutting pots, as described in a previous page, must now be rendered very hardy. This is to be effected by warding off heavy rains, and leaving them uncovered whenever it can be done securely. It is of course assumed that they are by this time in pits or frames, and the lights of those should be drawn up as regularly in wet weather as when there is likely to be frost. By keeping them dry, almost to a degree of want, they will be made more robust, and be better prepared for enduring all the uncongenial conditions of winter.

Of eqaul application to greenhouse and stove plants, of most species, are the observations just submitted. The great thing to be guarded against, for the next five or six months, is dampness. And where this is rightly kept under, there will be far less susceptibility to cold. Every specimen should be scrutinized, to see that it is not suffering or liable to suffer from inefficient drainage; and, even with the most careful potting, there will usually be some plants that need turning out, divesting of their soil, and shifting into a fresh or smaller pot at this season, on account of the stagnation of water about their roots. These matters cannot be adjusted too soon; for every day's continuance of the evil will only increase it, and render restoration more tardy and difficult.

In greenhouses, it is a common thing to put a number of half-hardy plants or inferior specimens under the stages during winter. The system is a bad one, for several reasons. It is prejudicial to the plants themselves, which, if there are no spare frames to hold them, had better be placed under a south wall, and covered with thin oiled canvass, or with thicker materials in frosty weather. Being beneath a stage, they catch all the water which falls from the plants above; and not only derive injury, but return it to the atmosphere more rapidly than it would otherwise evaporate, and so tend to load the air with moisture, to the detriment of the better plants. They are also very unsightly.

It ought to be a principle in every plant-house that nothing should be admitted but what can stand conveniently, and be cultivated to perfection. And if more plants are possessed than there is proper space for, the least valuable had better be discarded in some way. A limited number of really beautiful objects is infinitely more interesting than a larger quantity of indifferent ones.

Pelargoniums, when extensively cultivated, should be kept in pits and frames in the winter months. Having no flowers, they are comparatively uninteresting at that season, and it is far easier and less expensive to preserve them in pits. The house in which they bloom, during summer, can be filled with more pleasing greenhouse species; and these, again, may be transferred to frames when the structure is wanted for the Pelargoniums; since, at the period of their flowering, general greenhouse plants are mostly out of blossom.



S. Holden del. & Lith.

Rondeletia longiflora

RONDELÈTIA LONGIFLÒRA.

(Long-flowered Rondeletia.)

Class.
PENTANDRIA.

Order.
MONANDRIA.

Natural Order.
CINCHONĀCEÆ.

Generic Character.—*Calyx* with a sub-globose tube, and a four or five parted limb; lobes oblong-linear, acute, permanent. *Corolla* with a cylindrical tube, which is hardly ventricose at the apex, and a four or five-lobed spreading limb; lobes roundish. *Anthers* four or five, sessile at the top of the tube, inclosed. *Stigma* bifid. *Capsule* globose, crowned by the calyx, two-celled, dehiscing from the apex into two valves, which are usually cleft at the apex, whence it sometimes appears four-valved; but dehiscing usually at the cells, rarely at the dissepiment. *Placentas* central. *Seeds* numerous, small, ovate, angular, usually only two in each cell at maturity. *Don's Gard. and Botany.*

Specific Character.—*Plant* an evergreen shrub. *Leaves* opposite, sessile, oblong-lanceolate, acute, attenuated at the base, covered with very short down, and having numerous regular and prominent veins. *Flowers* in terminal panicles. *Calyx* with the segments slightly unequal, linear. *Corolla* with a slender tube, an inch and a half long, downy, and having a broad expansive limb, deep lavender blue. *Stamens* protruding beyond the mouth of the corolla.

Messrs. Veitch, nurserymen, of Exeter, imported this beautiful plant from Brazil, and it flowered for the first time at their Nursery in July 1842, when it was exhibited at the last great show of the London Horticultural Society. It was then producing large panicles of blossoms from the summits of most of the shoots, the plant being about eighteen inches in height, with numerous branches. It continued flowering for many weeks, and a specimen which we received in August had much finer and better-coloured blossoms than those which we saw in July.

The blossoms are borne in clusters, like those of *R. odorata;* but the bunches are so much larger, as to resemble more nearly those of *Luculia gratissima*, though rather more loosely disposed. The individual flowers have a tube an inch and a half in length, expanding into an open spreading limb, round the mouth of which the stamens are arranged, protruding slightly. The colour is a bluish lavender, very deep, and exceedingly attractive. There is also a trifling odour when the inflorescence is perfect.

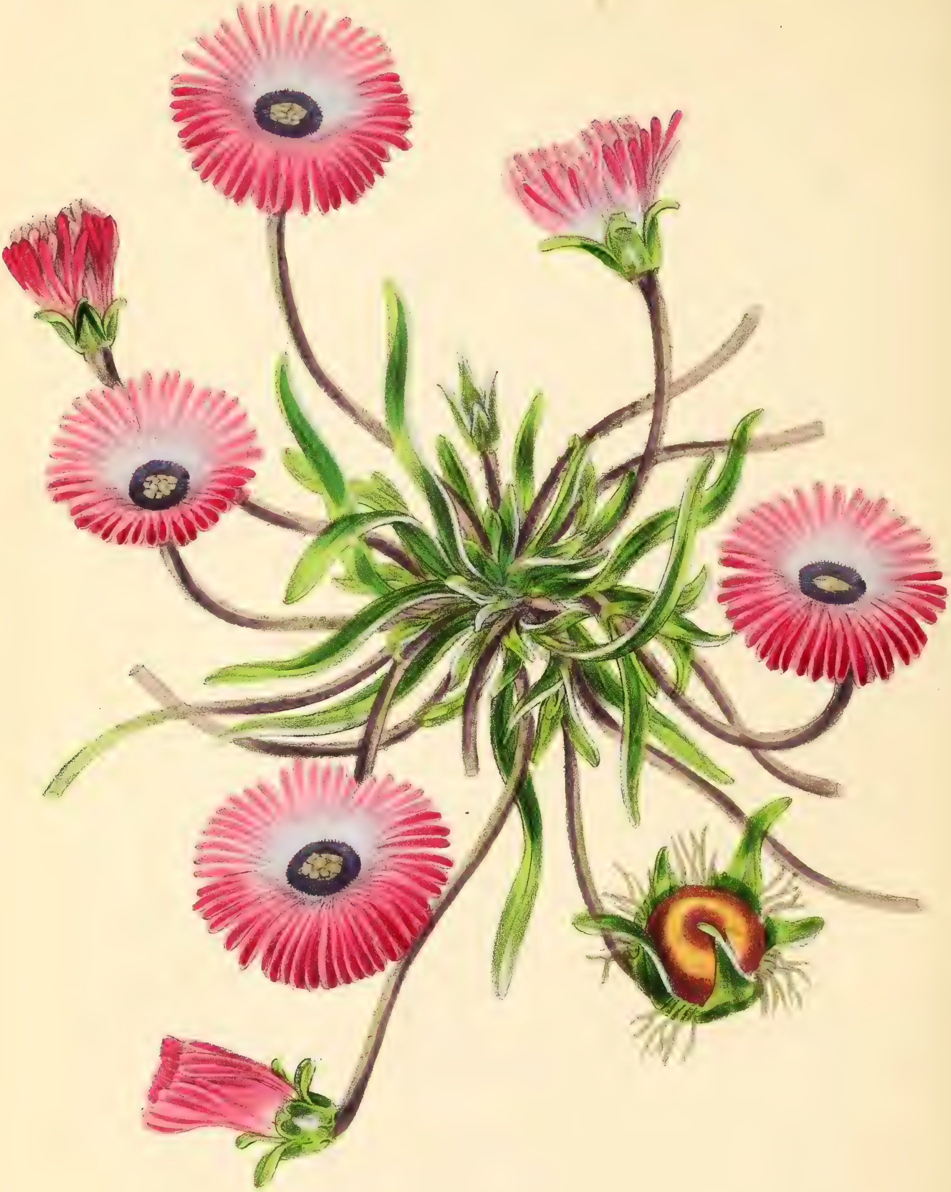
Those who cultivate *R. odorata*, well know its tendency to become straggling, and likewise what a great difficulty there is in rendering it anything like bushy. The present seems a somewhat more manageable shrub; and though rather inclined to make long bare shoots, may, most likely, be kept dwarf and compact by a timely pruning of the young branches. This appears to be the matter requiring most attention in its culture, and it should be very closely looked after in this respect.

With regard to other particulars, it may be potted in a mixture of sandy loam and heath-mould, of almost equal parts, with the addition, perhaps, of a little leaf-soil. Kept in a moderately warm stove, and not stinted for pot-room, it will soon attain a flourishing condition, and may be retained in health by a continuance of the same treatment.

Cuttings of the younger wood will root, with some tardiness, under a shaded hand-glass, in the stove; and the pots containing them had better be plunged in a tolerably strong hotbed.

From the extreme beauty and profusion of its flowers, it is likely to acquire considerable popularity. Our drawing was made from Messrs. Veitch's plant, in July last.

Rondeletia is named after William Rondelet, a noted physician, and lover of natural history, of Montpelier.



S Holden, del & Lith

Mesembryanthemum tricolor.

MESEMBRYÁNTHEMUM TRÍCOLOR.

(Three-coloured flowered Mesembryanthemum.)

Class.
ICOSANDRIA.

Order.
DI-PENTAGYNIA.

Natural Order.
FICOIDEÆ.

Generic Character.—*Calyx* of five, rarely of two to eight sepals; sepals united to themselves and to the ovarium even to the middle; lobes unequal, usually leaf-formed. *Petals* innumerable, in one, but oftener in many series, united among themselves at the base. *Stamens* indefinite, disposed in many series, inserted with the petals at the top of the calyx. *Ovary* adnate to the calyx, many-celled inside, (four to twenty,) but usually five-celled. *Stigmas* four to twenty, but usually five. *Capsule* many-celled, opening stellately at the apex, adnate to the permanent calyx. *Seeds* numerous. *Embryo* curved at the side of a mealy albumen. *Cotyledons* thick, very blunt.—*Don's Gard. and Botany.*

Specific Character.—*Plant* annual. *Stems* nearly prostrate. *Leaves* long, strap-shaped, acute, green. *Flowers* mostly radical, solitary. *Peduncles* long, covered with little warty protuberances. *Calyx* of five leafy segments. *Corolla* deep pink; petals curving backwards. *Capsule* nearly round, depressed in the centre.

Except the showy species of *Portulaca*, there are not many dwarf tender annuals adapted for growing in pots, to place on low and prominent stages in the greenhouse during summer. And where the system of cultivating the better kinds of greenhouse plants in retired houses or frames while they are not in bloom is practised, and a show-house is kept for the constant exhibition of flowering specimens, it will be found necessary to grow several sorts of annuals, for keeping up a display throughout most of the summer and autumnal months.

As a very dwarf and interesting object, well fitted for placing on front shelves near the eye, the plant before us will be exceedingly serviceable, and will cause a pleasing variation among the sorts of *Portulaca* suited for the same purpose. The fact that it was introduced to our gardens as early as the year 1795 will not prove a drawback to its employment; for if it were to be cultivated for its novelty, the lengthened period through which it has been disregarded gives it almost a claim to be regarded as novel, while its more decided merits, and those which have prompted us to figure it, render it a worthy object of the culturist's notice.

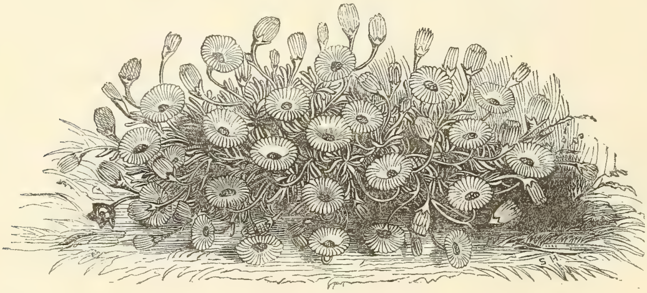
We met with it accidentally at Messrs. Henderson's, Pine-apple Place, where it was blooming, in the late summer, both in pots and in the open border. We have subsequently observed it at Messrs. Rollisson's, Tooting, and it is doubtless to be obtained of any nurseryman or seedsman.

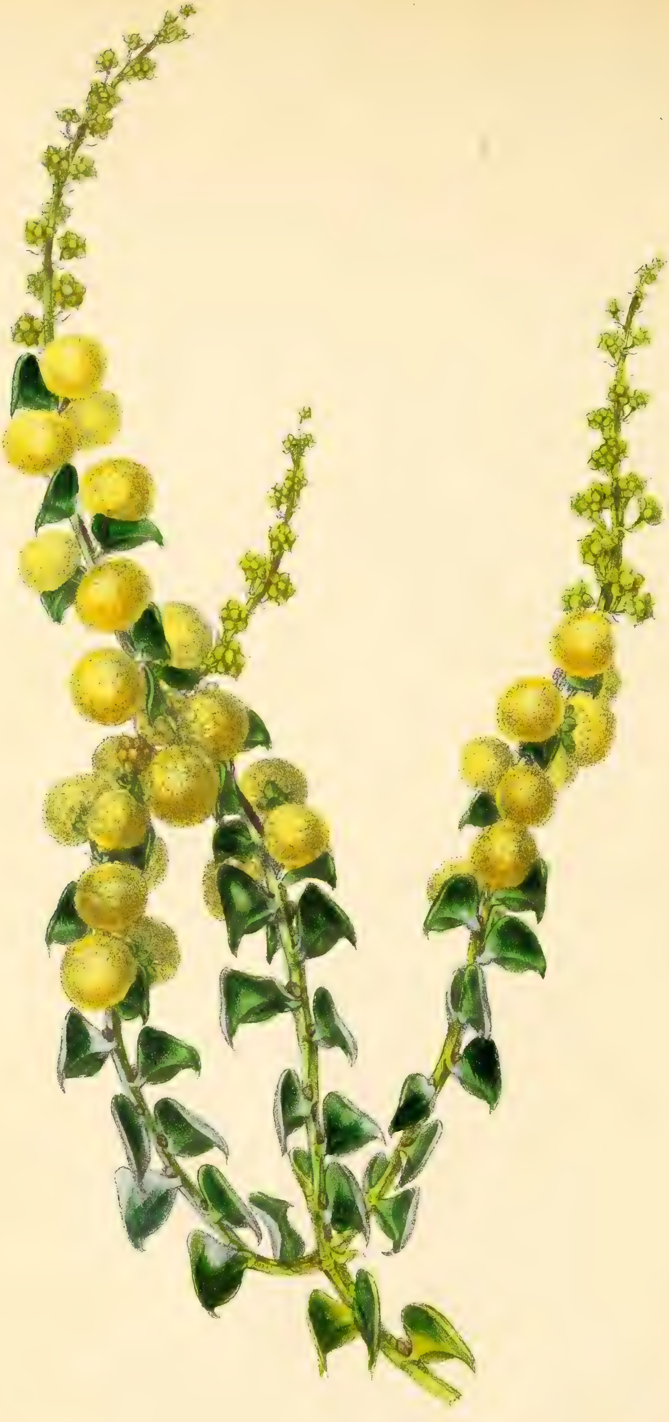
It should be treated like other tender annuals, by being sown thinly in a pot, about the month of March; or later, if it is wanted for autumnal decoration. The pot containing the seeds may be plunged into a gentle hotbed till they germinate. The soil in which they are sown should be particularly sandy, and well drained; the pots used being as shallow as possible. When two or three leaves are formed, the young plants must be potted into the smallest pots, one in each, still using a very sandy soil, and putting them in a warm frame till they are established. They may then be transferred to a colder frame or a greenhouse, where they should stand close to the glass, so that they may receive the largest procurable supply of light. After being potted, they ought to be watered very carefully, because their succulent nature makes them liable to be destroyed by damp.

When they require shifting again, they may be re-potted into a richer loam, with which a little leaf-mould and sand can be blended; or they may be turned out in a bed in the flower-garden as soon as frosts have ceased. Wherever kept, they should always be well exposed to the sun; for the flowers will not expand unless under the influence of his rays. They continue blooming for several months, and are interesting even when they are covered with nothing but seed-vessels. The beauty of the flowers, when they are fully opened, is very striking.

For saving seeds, a few plants should be reserved in a frame, and from six to a dozen capsules be left on each, removing all the other flowers that show themselves.

The origin of the generic name is in *mesembria*, midday, and *anthemon*, a flower; the blossoms rarely unfolding till the sun has shone upon them for some time.





S.Holden. del & Lith

Acacia biflora.

ACÀCIA BIFLORA.

(Two-flowered Acacia.)

Class.
POLYGAMIA.

Order.
MONŒCIA.

Natural Order.
LEGUMINÒSÆ.

Generic Character.—*Calyx* four or five-toothed. *Petals* four or five, sometimes free, and sometimes joined together into a four or five-cleft corolla. *Stamens* variable in number from ten to two hundred in each flower. *Legume* continuous, dry, two-valved.—*Don's Gard. and Botany.*

Specific Character.—*Plant* an evergreen shrub. *Leaves* small, sessile, alternate, unequal, knife-shaped, sharp-pointed. *Flowers* axillary, solitary or in pairs, globose, deep yellow.

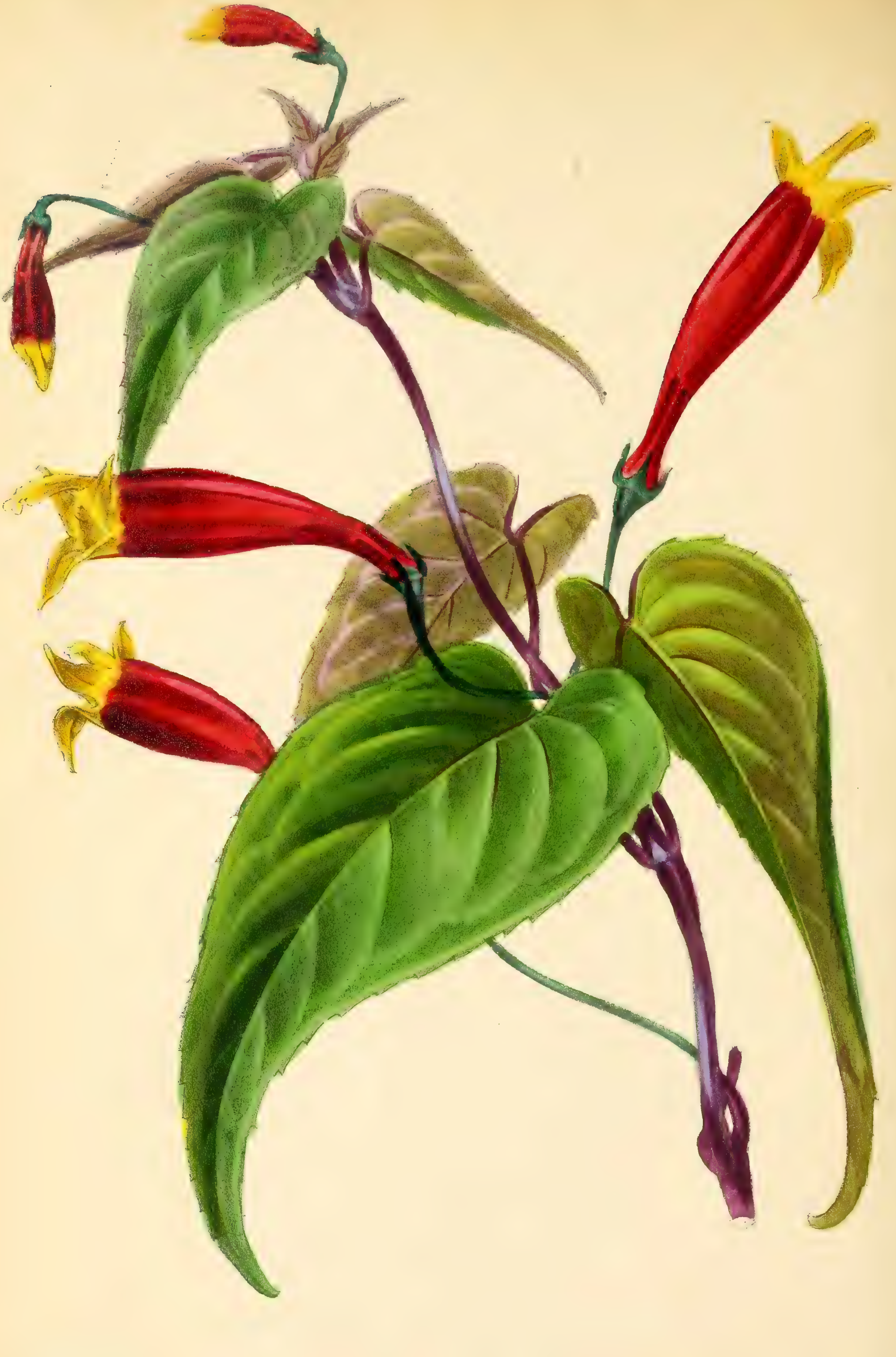
By a reference to the botanical catalogues, it appears that the present species of *Acacia* was brought to this country in 1803. It has, however, been nearly or quite lost since that time, and was again raised, about two years back, from one of the many importations made by Mr. Low, of Clapton, from New Holland. It flowered at the Clapton Nursery in February and March 1841, and our artist made the accompanying drawing of it at that period. We believe no published figure of it previously existed.

Along with most of its allies, it is a valuable and interesting greenhouse plant, on account of its blooming so early in the season. Its habit is neat and tolerably compact, and it grows to the height of from eighteen inches to three feet. The leaves are of a peculiar form, one side of them being nearly wanting, and the other taking a wide curve at its margin, so as to resemble, in outline, the upper edge or back of a common sickle. They are small and sessile, having the flowers in their axils. The blossoms appear in pairs, or singly, and besides existing in the axils of the leaves, form a kind of loose spike at the extremity of the shoots. They are capitate, or in round heads, of a moderate size, and having a deep yellow or orange tint, with a very pleasant fragrance.

In cultivation, it ranks with that part of the genus which, not being of rampant growth, do not need such large pots, nor to be so frequently shifted. Some of the *Acacias* are remarkable for the abundance of their roots, and the rapidity of their extension; but these are also very strong-growing kinds, and generally attain the size of trees. The plant under notice belongs to the class of comparatively feeble low shrubs, having by no means so many nor such vigorous roots. It should be potted in the common mixture of sandy loam and heath-soil, leaving the main roots a little elevated in the centre of the pot. During the first stages of its growth, it may be desirable, in order to render it bushy, to give it a little pruning; but if properly managed as regards light and air, it will not need much of this afterwards.

Our subject should be placed in a part of the greenhouse where it will not be either shaded or crowded, and its stems should be prevented, by timely pruning, from becoming long and bare. This is one of the chief defects of Acacias; and it is the more displeasing because it may be so easily obviated.

Cuttings taken from the tops of the shoots will form roots, though but slowly, if treated in the ordinary manner.



S.Holden, del & Lith

Siphocampylus betulæfolia.

SIPHOCÁMPYLUS BETULÆFÒLIA.

(Birch-leaved Siphocampylus.

Class.
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
LOBELIÀCEÆ.

Generic Character.—*Calyx* five-lobed, tube turbinate or hemispherical. *Corolla* with the tube generally ventricose towards the top, and considerably recurved, entire, or very rarely cleft to the base, and seldom entire at the summit; limb five-lobed, shorter than the tube, two-lipped; upper two lobes often larger, reflexed, lower three generally shorter. *Stamens* connate. *Anthers* in the lower part of the flower bearded at the summit, or rarely all hairy.

Specific Character.—*Plant* an evergreen shrub, two feet or more in height. *Stem* branching, round, glabrous. *Leaves* alternate, petiolate, ovate-acuminate, subcordately triangular, doubly serrated, nearly smooth. *Calyx* with the segments subulate, serrulate, acute. *Corolla* slightly curved, bright red; lobes narrow-lanceolate, acute, deep yellow. *Stamens* and *style* a little exserted.

One of the many handsome things sent to Britain by Mr. Gardner, from Brazil. It was found by that collector on the Organ Mountains, where, observes Sir W. J. Hooker, "Sello, its original discoverer, had probably previously procured it." It was most likely received primarily at the Glasgow Botanic Gardens, from whence it was distributed to several collections.

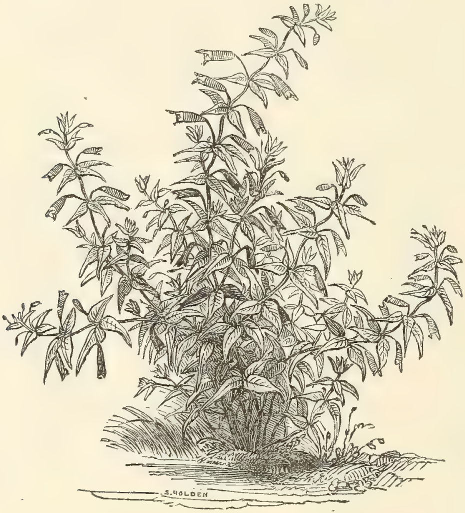
In the Botanical Magazine for last month, it is supposed that it bloomed for the first time in Europe at the Royal Botanic Gardens at Kew, in July last; but we saw it in bloom, quite at the beginning of the present year, in the nursery of Messrs. Young, Epsom, and the drawing now furnished was made from a flowering plant belonging to these gentlemen, in May 1842. It had been obtained from the Glasgow Botanic Garden.

The foliage of the plant is both curious and attractive. The sides of the leaves are somewhat unequal, their upper surface is of a delicate light green, and they are of a beautiful pale purplish hue beneath. These circumstances, added to their uncommon length, give them more the appearance of some *Begonia* leaves. The flowers are borne solitarily from the joints of the stem, and stand out on long slender peduncles. The colour of their tube is a singularly brilliant scarlet, and the limb is of a dark yellow tint. The contrast made by these extremely showy colours, in conjunction with the fine tints of the leaves, is particularly agreeable. Each of the blossoms lasts for a very considerable time, and there is a succession of them throughout the whole of the spring and summer months. Indeed, the species seems to blossom almost perpetually.

Being at present scarce, and having only been kept in a stove for propagation, its ornamental character is hardly tested. Most probably it will be found to succeed best in a stove through the early spring months, and then bloom better by being removed to the greenhouse, or to a structure intermediate between the two. It should be potted in a compost of light loam and heath-soil, and not be placed in too large a pot till it has acquired strength enough to demand greater freedom.

It is increased by cuttings, which must be planted in sand, or a very sandy soil, and carefully guarded from superfluous moisture.

The derivation of the generic title is *siphon*, a tube, and *kampulos*, curved ; the tube of the corolla being arched in a peculiar manner. The leaves of the species figured are thought to be like those of the birch ; hence the name *betulæfolia*.



GARDENING AS A SCIENCE.

No. X.—WATER.

This most wonderful of fluids, which might, without much violence to the understanding, be considered the base of all created things, was supposed to be a simple element—one of the four; and even now the associated terms, fire, *water*, earth, and air, are familiar, and come trippingly off the tongue. Little more than sixty years have elapsed since the theory of the early chemists was abandoned, after our countrymen, Priestley and Cavendish, had effected the decomposition of water; and the discovery had been detailed in the *Mémoires* of the French Academy in 1781.

A variety of experiments are described in books of modern chemistry; but none are so conclusive, sublime, and illustrative, as those of Faraday, which are found in his *Experimental Researches on Electricity*, the whole collected from the Philosophical Transactions of the Royal Society, in an octavo volume, published by Taylor, 1838.

The *decomposition of water* by means of the galvanic, or voltaic battery, produces, in the purest state, two gases, which have been already alluded to, and always in definite proportions. Thus, as stated by Brande, with an accompanying diagram (*Manual*, p. 275)—"If a glass globe, with two orifices, each have a tube adapted to it, so as separately to receive the gas from each wire, it will be seen that *two* volumes of *hydrogen gas* and *one* volume of *oxygen gas* are respectively collected in the tubes, the one inserted over the *negative* wire, and the other over the *positive*."

But the hydrogen separates, always, at the negative pole, and therefore is a positive electric; and though double the oxygen in volume, is only $\frac{1}{16}$th of its actual weight. Hydrogen gas, therefore, is separated into infinitely minute particles or atoms by electricity, so much so, that it is deemed to be the lightest of all material substances that have weight!

Now, it is clear that these gases, *hydrogen* and *oxygen*, had existed together in the form of fluid water; but that a stream of electricity being passed through the water effects a separation of the elements of that fluid, and produces them in the form of gas; a condition in which the particles are in a state of extreme division. Of the phenomena of separation we are enabled to obtain some idea by referring to the following paragraphs of Dr. Faraday's Seventh Series, at p. 250.

"It is wonderful to observe how small a quantity of a compound body is decomposed by a certain portion of electricity. Let us, for instance, consider this, and a few other points, in relation to water. *One grain* of water acidulated to facilitate conduction, will require an electric current to be continued for three minutes and three quarters of time, to effect its decomposition, which current must be powerful enough to retain a platina wire $\frac{1}{104}$ of an inch in thickness" (and of any length) "red hot, in the air during the whole time, and if interrupted anywhere by charcoal points, will produce a very brilliant and constant star of light. If attention be paid to the instantaneous discharge of electricity of tension, as illustrated in the beautiful experiment of Mr. Wheatstone, and to what I have said elsewhere on the relation of common and voltaic electricity, it will not be too much to say that this necessary quantity of electricity is equal to a very powerful flash of lightning. Yet we have it under perfect command; can evolve, direct, and employ it at pleasure; and when it has performed its full work of electrolyzation, it has only separated the elements of a single grain of water!" Again—

"On the other hand, the relation between the conduction of the electricity, and the decomposition of the water is so close *that one cannot take place* without the other. If the water is altered only in that small degree which consists in its having the *solid* instead of the fluid state, the conduction is stopped with it."

Our object in citing these evidences is two-fold—*first*, to prove that water cannot be decomposed without the passing of an electrical current, and therefore, that whenever the condition of water is changed, throughout nature, the change is produced by natural electricity, or in other words, by some chemical attractions between bodies possessing different electrical relations. All meteorological phenomena depend upon some disturbance of the aqueous elements; therefore, we conclude that they are essentially electrical. We are but too apt to refer all our ideas of electricity to the phenomena of the thunder-storm, forgetting that not a particle of dew, or of the mist which floats on the surface of the earth, could exist without the agency of some electric attraction. All nature, indeed, is replete with this vitalising principle.

Second—We remark that our author has alluded to water in the *solid* form, a condition in which the passing of the current is arrested. Water, then, is admitted to exist in three states, the vaporous, the fluid, and the solid; and with this admission we claim another, namely that the elements of water, hydrogen and oxygen, are equally capable of existing in the same forms. When solidified, as in the state of ice, electricity does not pass; on the contrary, a globe or cylinder of ice can be excited to transmit sparks of electricity; fluid water *can* conduct, but not so freely as when mixed with a minute quantity of any mineral acid; but water in the state of steam is an absolute vehicle of electricity, hence the peculiar feeling of chilliness which attends a moist condition of the atmosphere.

The development of oxygen and hydrogen gases during the decomposition of water, by the passing of the electric current, proves to a demonstration that these bodies are replete with electricity, but existing in two opposite conditions, each, however, capable of attracting, blending with, and neutralizing the other.

The re-union of the two, and the consequent re-formation of water, is effected silently, or with more or less violence, according to predisposing circumstances;

and on this point Faraday says, "I cannot refrain from recalling here the beautiful idea put forth, I believe, by Berzelius, in his development of his views of the electro-chemical theory of affinity—that the heat and light evolved during cases of powerful combination, are the consequence of the electric discharge which is at the moment taking place. The idea is in perfect accordance with the view I have taken of the *quantity* of electricity associated with the particles of matter." (P. 256, No. 870.)

Hydrogen gas burns with a light, bluish flame, provided it have access of some air, but in the total absence of air, it is incombustible, and will extinguish a lighted match or taper. Blended with oxygen, and suddenly ignited, the mixture explodes with tremendous violence; but if slowly consumed, with an appropriate apparatus, containing oxygen, *hydrogen* never burns without producing a quantity of water, equal in weight to that of the two gases consumed: hence its name, which implies the generator or base of water. Whence comes the flame which precedes the formation of water? and how, we then ask, how does it happen that in the combustion of spirits, of oil, tallow, resins, wood, water in vast quantities is always produced? Can we form any other reasonable conjecture than that the electricities, which "are naturally associated with," and give form to all material things, are thus liberated and become visible. Combustion is a mystery—that, we are prepared to admit; but flame, and light, are realities, which appeal to the understanding, and afford evidence not to be resisted, that they are not new creations, but developments of powers which had lain masked and hidden only, till called into activity by peculiar attractions.

As water, therefore, is always formed by the combustion of bodies which contain hydrogen and oxygen, we might be led to infer that it is, abstractedly, a product of combustion. But facts appear to militate against such a conclusion, and rather lead us to infer that water is itself primordial, and that the vegetable organization and its productions are mainly dependent upon the decomposition of water through the electrizing agency of solar light. At all events, decomposition and re-combination are ever proceeding in one eternal circle, and thus decay is but one of the many conditions which lead to re-construction.

The gardener, who supplies his drooping plant with this "*simple element*" of the olden time, presumes that it inhales the refreshing stream, and there an end. But, with the spread of knowledge, he will learn that two, at least, of the elements of the organs, and all the organic products of every plant in nature, are furnished by this insipid fluid. This view of the subject alone will confer importance on the science of horticulture; and we therefore earnestly impress the consideration of the vast utility—nay, of the essential necessity, of applying electro-chemistry to the practice of both agriculture and horticulture, for by it alone can any rational idea of *causes* be obtained. Other opportunities will, however, occur to revert to this consideration.

A question has arisen on the comparative applicability of hard and soft waters to vegetation. Essentially as a base, both are the same; but *rain-water* contains a very minute quantity of atmospheric ammonia; pond or river water abounds more or less with animal and vegetable substances; and the water of wells or springs, which alone can be justly considered *hard*, holds in solution certain quantities of *lime*, either in the state of a *sulphate or carbonate;* and these mineral substances decompose and curdle soap.

We know one nurseryman, who has only hard-water at general command, and yet he grows beautiful plants, and in high condition. Pond-water, which, strictly speaking, is the result of rain, filtered through the adjoining meadows, is on all accounts, perhaps, the best fluid that can be employed by the gardener; but the fact is that *hard-water*, when poured upon soil, is partially decomposed, and the lime, or salts of lime, are deposited. Thus we have even observed the soil of a pot become to appearance a mass of mere rust, by watering it for weeks with a solution of salt of iron; therefore it appears probable that the mischief from hard-water is more imaginary than real; and that, if such water were exposed in wide cisterns, or what is better, in clay-bottomed tanks, for some days, it might be employed with advantage. A few grains of carbonate of ammonia will tend to soften a great quantity of water; but all chemical salts should be used with caution, as experiments only; and if we are expected to acquire knowledge from experiment, the results should be attentively observed, and noted. As yet, all our establishments are conducted upon a principle of routine; hence the confusion which prevails, and the perplexity that attends empirical practice. We observe *effects* little, and know still less of *causes.*

SHRUBS FITTED FOR PLANTING IN BEDS.

Our last paper on this subject (p. 204) occupied the attention of our readers with a consideration of the propriety of planting shrubs in beds, the situations in which these should be placed, their form, and the preparation of the soil for the different objects that are to fill them. Now we are to speak of the kinds of shrubs most suitable for the purpose, and the treatment of any portion of them that may require peculiar culture.

We shall first refer to those very dwarf sorts of shrubs which assimilate most to herbaceous plants, and may most readily be substituted for them. The different dwarf hardy Heaths, which are so easily cultivated, and produce their beautiful flowers for so long a period, remaining interesting even when deprived of blossoms, are singularly engaging objects in beds. They may be planted so as to compose a thicket, in the wildest parts of the pleasure-grounds; and for such purposes, the native and common species should be chosen, and only one sort be placed in a patch; or the better kinds can be brought together in larger groups, and put three or four feet apart, so that they can spread themselves on all sides without overrunning their neighbours. A bed of this description will be always attractive; for while there is a dearth of bloom, the contrast of the fine green foliage with the black heath-soil will be perpetually agreeable.

One advantage of growing these hardy Heaths is that they never require any attention after being planted, and that very few weeds will grow in the soil that suits them best. If the plants be healthy at the time of transplantation, they will extend their branches naturally and regularly in all directions, and form the most symmetrical and pleasing objects, without pruning, support, or any kind of tendance. They demand, originally, a good depth of heath-mould; and if this be supplied, their wants are at an end.

Dwarf Heaths may, at pleasure, be collected into a small garden by themselves; and as some of the different species or varieties will be nearly always in flower, such a feature is a very delightful one in a garden. The Heathry, however, ought rather to front a grotto, summer-house, or other rustic erection, than to be near any highly-adorned or architectural structure. And its arrangement should never be in the formal parterre fashion, but more in the irregular and diversified manner of the modern English style. There is something in the nature and habits of Heaths which adapts them better to scenes and objects in which there is some degree of wildness and rudeness, than to more artificial and polished places.

A Heathry may be arranged upon grass, and intersected with grass paths, or have gravel or paved walks among the beds. Paved paths are particularly objectionable, because they give too much of the appearance of art, and gravel ones are but a slight improvement on them. They may be tolerated, however, for the sake of introducing the common Ling (*Erica vulgaris*) and its varieties as an edging. If kept neatly trimmed, this constitutes a very excellent substitute for Box. Still, the turf walks are in all respects preferable.

Instead of having only one or two plants of a sort in a Heathry, there should be at least one entire bed of every kind. No plants are more liable to die off suddenly than Heaths, and it is, therefore, important to provide against the loss of a few specimens. They should, nevertheless, be planted far enough apart to admit of each specimen extending itself without obstruction, so as to form an individual object; departing from this rule in the case of some of the common species, for the purpose of producing variety. Nothing at all like arrangement according to affinity should be attempted, but each sort should be placed where its height, or the colour or figure of its flowers, will give it the best effect. A glance at the period of flowering, too, with the view of having those which bloom at the same time distributed as equally as possible, will not be unserviceable.

While noticing Heaths, we cannot refrain from suggesting that the common Ling might be more frequently employed in the pleasure-grounds. In those wild and sequestered spots where the ground is rugged, or presents here and there an uneven slope, near a walk, a few masses of Heath, with pieces of weatherbeaten or moss-covered rock peeping out from them occasionally, would communicate an air of rusticity which might be otherwise wanting, and which would be particularly desirable in tame, flat, or suburban districts.

There is a small tribe of peat-loving plants, resembling Heaths, and which might very properly be associated with them, included in the genus *Menziesia.* They are seldom destitute of their pretty purplish blossoms, and can be cultivated with as much facility as Heaths. They are not, however, so freely inclined to spread, or to be compact in their growth; and hence they are frequently benefited by a little pruning. The time for performing this is while they are yet small; for it is about as fruitless to attempt to prune an old shrub into neatness, as to train an old climber that has never been interfered with, or to instruct an ignorant person in the decline of life. In all these instances, something may be accomplished, but it is far from being satisfactory. The pruning should be done early in the spring; and the sacrifice of flowers for a year or two ought not to be considered an obstacle.

Another elegant little shrub that thrives most perfectly in heath-soil, is the *Epigœa repens.* Planted thickly in a prepared bed of good heath-mould, it soon expands into a carpet, and bears a very large quantity of lovely white flowers in May and June. The blossoms are deliciously fragrant. We saw large beds of it in admirable order at Mr. Waterer's, Knapp Hill, last season, and are convinced that it is very inadequately known or cultivated. When once established, it needs no additional management.

The interesting family of *Vinca,* although extensively used for carpeting shrubberies, borders, and rockwork, are rarely if ever to be met with planted in detached beds; and yet no plants are more suited for the purpose. It is commonly supposed, because they flourish so well in shady situations and beneath trees, that they will not bear exposure. Such an opinion is altogether wrong. They will thrive in almost any circumstances, and certainly succeed, to admiration, in some of the sunniest spots that could be found. The *V. major* is perhaps least adapted for beds, on account of its growing so rapidly; but as it will endure any amount of pruning, this is scarcely an objection. In trimming its branches, they must not be cut off formally round the edges of the bed, as if the operation had been done with shears. The majority of them should be cut farther back than the rest, and a sufficient number of young shoots be left to cover them, so that no stumps shall be apparent. These trifling matters appear insignificant in themselves; though it is astonishing how they affect the aspect of a place.

Vinca minor and its varieties, especially the variegated one, compose groups of the most interesting character. Each sort should be kept by itself; and the beds ought not to be large, while they will be much improved by being raised a good deal in the centre. Mr. Perry, of the Banbury Nursery, Oxon, has a variety of *V. minor* with double blue flowers, which are described to us as being like those of the double blue *Hepatica.* No doubt this plant would make an admirable one for planting in beds.

Some time ago, we detailed a plan of treating *Clematis cœrulea*, whereby it could be transformed into a dwarf shrub. The process, as will be remembered, consisted in constantly layering the shoots, and leaving portions with buds on them above the soil at frequent intervals. These buds being developed into short flowering branches, a most splendid shrub is produced, and two or three beds of this would contribute a remarkably fine feature to a pleasure-garden. The system is likewise, without question, applicable to *C. Sieboldii*, to other climbing species that are worthy of the trouble, and to many similar climbers. Several kinds of Honeysuckle, the sweet-scented Jasmine, and others, would, if thus treated, have a peculiarly novel and delightful appearance, if grouped together in beds about the pleasure-grounds. The trouble of layering them would not be great, and they would soon arrive at a blooming condition, when they might be kept low by additional layering, and by pruning. It is indispensable that the process be effected while the plants are young, the advantages of early training requiring no enforcement here. It is also essential that it be done neatly, so that none of the old stems be disagreeably perceptible. Indeed, the stems should, if possible, be kept wholly out of sight, that the young shoots may appear to be independent plants, rising directly out of the earth.

If it be thought that the utility of the above method is questionable, and that its benefits—those, we mean, of converting climbers into dwarf shrubs—might be realized by simply planting young specimens, and keeping them pruned down to the requisite dwarfness, we must correct such an opinion. From the nature of climbing plants, it would be next to impossible to prevent them from rising or trailing, and, at the same time, to render them ornamental. And the parts which, though having roots of their own, are still connected with a parent stock as branches, will grow within tractable limits, and flower most abundantly, would not, if detached, be susceptible of the same dwarfness by any amount of pruning, and would blossom with infinitely less freedom under such conditions. Every one is conscious that climbing plants bloom best on the laterals thrown out from the old wood, after it has reached a certain length and gained a particular age. By the mode of treatment we recommend, that oldness and length would be obtained, and, simultaneously, a superior number of lateral shoots, in consequence of the main branches being so repeatedly bent. The curves created in the branches by layering must inevitably promote fertility ; and the management of the plants, after they had been brought into a good flowering state, would be precisely that which they would have received had they been grown as ordinary climbers. By pruning back yearly the young branches, an increased quantity of flowering ones will continue to spring from their base.

In layering the shoots of climbing plants after the manner thus indicated, it is immaterial whether they be fastened down with a peg, or merely have a stone of sufficient size placed upon them to hinder them from rising. They should not be twisted, nor any incision be made in them, since it is not so much the object to cause them to produce fresh roots, as to induce them to throw out branches liberally from the exposed portions, and to conceal the parts that are devoid of shoots.

One of the prettiest and most valuable of all shrubs for small beds is the *Daphne Cneorum.* The beautiful deep pink hue of its blossoms, their odour—which is so universally grateful, and the profusion in which they are borne both during the spring and autumn months, make it a general favourite. Besides, it is an evergreen, of good habit, and very dwarf. But it is usually found hard to cultivate, and often dies in some positions. The fact is, that, coming from mountainous regions, it will not thrive in confined spots, nor where the earth is of a clayey or adhesive nature, nor amongst other shrubs or plants. It ought to be grown in a separate bed, the soil of which should be made ready before planting, and consist of two-thirds light loam from a meadow, and the remainder open heath-mould. The bed should be above the level of the surrounding grass or paths, and in a position where it can receive plenty of sun and air without being liable to cutting winds. If a few of the shoots are kept layered, and one or two of the plants thus obtained be planted at times near the stools of the old specimens, which are apt to become bare, it will entirely cover the soil of a bed, each plant occupying a diameter of from two to three feet. Sometimes the stems do not become bare in the middle of the plant; and then, of course, they will not need the aid of young ones. The plants will remain perfect for several years; and when they show symptoms of decay, all the branches should be layered, and these, in the following season, be taken up, and shifted to a fresh place, or re-planted in the same bed, filled with new soil.

Polygala Chamæbuxus is another neat dwarf shrub, and though not so showy as the last-named, produces an immense quantity of its pretty yellow and white blossoms, and is an evergreen. It should be treated as the former; only it is not desirable that the specimens should grow into each other, because they are seen to greatest advantage when alone. They ought, therefore, to be planted rather more than two feet apart. Being very diminutive in height, it is only fitted for beds of limited dimensions, and succeeds in any open situation, with the same soil as that prescribed for *Daphne Cneorum.*

For further aiding to fill beds that require very low-growing shrubs, *Berberis empetrifolia* is a charming little plant. It is commonly reserved for rockwork, of which it is an excellent ornament, but need not be restricted to such a locality. In any dry open bed, exposed to the sun and sheltered from cold winds, it will flourish well with a light loamy earth. Its nature is somewhat trailing, and it does not rise many inches above the ground, extending laterally a foot or eighteen inches on either side. It suffers greatly if subjected to excessive dampness in winter, or severe drought during summer, and is healthiest in circumstances wherein both are provided against. The deep yellow blossoms have a very lively aspect when expanded, and the plant blooms both liberally and for a great length of time, afterwards bearing a handsome berry. The berries, however, seldom ripen in England; and this is the less to be regretted, because they would materially weaken the plants.

A plant which may be maintained, by judicious pruning, at the height of nine inches or a foot, and is admirable for placing in a bed of moderate limits, is the *Gaultheria Shallon.* The careful application of the pruning-knife to it while in a young state will render it almost inconceivably bushy, and we have witnessed specimens, so treated, from four to five feet across, and not more than a foot high all the upper surface being covered, in summer, with long and graceful spikes of delicate pinkish-white flowers. The amplitude of its evergreen foliage is also a noble characteristic, and a tolerably large bed, containing nine or ten specimens, so far apart that they did not touch each other, would be exceedingly beautiful. One of smaller dimensions, capable of holding four or five, would likewise be highly ornamental. It is readily increased by layers, and grows luxuriantly in loam, or loam and heath-mould.

We have frequently been surprised that the much-admired *Cydonia japonica* is not more used for planting in beds. The peculiar showiness of its blossoms, and the long season through which they are developed, give it strong claims to notice as a tall shrub and a climber; and we do not perceive why its susceptibility of various treatment should not be taken advantage of by retaining it dwarf. Few plants endure pruning with less injury; in fact, it belongs to a tribe which will always flower better for pruning, if not grown in an extravagantly rich soil. Its tendency to throw out suckers from the base, when freely pruned, is another reason why it should be made to subserve the end we allude to, as, by that propensity, it would the sooner fill a bed. Our plan would be to begin pruning it when it is quite young, and to continue pruning as it advanced, layering the lowermost branches, and reducing the suckers as well as the original stems. Plants not more than a foot in height might thus be made to occupy the entire surface of small beds, and others, of greater height, would similarly fill beds of larger size. The pale-flowered variety can be treated in the same manner, and we know nothing with which a conspicuous bed can be more advantageously furnished. A good supply of light and air are only needful for it, as it will grow in the commonest soil.

Two species of *Cotoneaster*—*C. rotundifolia* and *microphylla*—are chiefly made use of in rockeries and borders; but they nowhere exhibit themselves more finely than when grouped together in beds. Their habit is naturally trailing, and the inequalities of a rockery demand that a trailing plant shall have tolerably pliant branches, in order to adapt itself to the surface. In an ordinary border, again, a trailer is almost lost amidst the numbers of taller and more prominent plants. Planted in a bed, on the other hand, such species as these must command attention, and the nature of the surface is exactly suited to their character. They unfold immense quantities of pretty white flowers in April and May, and these are succeeded by showy bright scarlet berries, which, with the leaves, remain on all the winter. The soil of the commonest gardens suits them, and they occasion no trouble. We would, however, place a layer of pebble or other tidy-looking stones on the top of the earth after planting them, that the branches may repose on them, and not have their leaves, blossoms, or berries, liable to be splashed with dirt by heavy rains.

Most of the members of the genera *Cistus* and *Helianthemum* are too notoriously fitted for planting in beds to want mentioning here. By some strange chance, however, we are very rarely afforded an opportunity of observing them in this state, and believe that the majority of cultivators totally neglect them. The diversity of colour in their blossoms, and their very extraordinary profusion as well as durability, render them almost the showiest shrubs, of humble growth, that we possess. They require nothing but a light loamy soil, in an elevated situation, where they can get the whole of the sun's rays. They can be propagated extensively either by seeds or cuttings, and should be transplanted with great care. Some of the double-flowering kinds are singularly handsome, and there is not a group of plants more deserving of culture in beds.

Hyperium calycinum is an extremely common shrub, and largely planted as undergrowth in the shrubberies of many gardens. Besides its adaptation to that object, it is a good plant for forming into beds in the distant parts of the pleasure-grounds, where open glades occur by the sides of shrubbery walks. It is both an evergreen and a free bloomer, while the flowers are also large and attractive. Scarcely anything injures it, and it is useful for planting beneath trees, where the sun scarcely ever shines.

As we lately gave a figure of *Pentstemon crassifolius*, and then stated that it and *P. Scouleri* were suitable for being grown in beds, it is unnecessary to advert to them at present. With these and all shrubs of like habits, it is advisable to keep a few of the young shoots constantly layered, that there may always be a stock to renew them from whenever the original specimens become feeble.

Not a few of the species of *Genista* would answer the end treated of in this article. We shall only name two, *G. triquetra* and *sagittalis*, which, with *Cytisus purpureus*, may be appropriately grown in beds. They are all dwarf, showy, and inclined to trail. They can, moreover, be cultivated in any garden earth, and ask no attention after planting.

No plant is more lovely when in blossom than the common Lavender, and yet it is never found in pleasure-gardens. We would introduce occasional beds of it, as well for its beauty as its fragrance; and, being evergreen, it could not be unsightly in winter. A light soil and sunny situation are most congenial. If the uniform height of its flower-stalks be considered an objection to growing it in beds, this can at once be obviated by making the surface of the bed higher in the middle, and sloping down to the edges. It is multiplied by slipping off the branches, and planting them entire.

Of larger plants, there are the numberless Rhododendrons and Azaleas. We do not dwell on them, however, as it is the purport of this article to bring to light those which are not often employed in grouping. Allied to them in habit, and in the kind of soil they demand, are the species of *Kalmia*, *Ledum*, *Lyonia*, *Andromeda*, *Vaccinium*, &c., on which we are equally unwilling to remark, as there is nothing peculiar in their treatment. They are all capable of being cultivated to perfection in beds. Our space will but just suffer us to specify, in addition, *Deutzia scabra*, which, by pruning, might make a pleasing group ; *Ribes sanguineum*, which would form a splendid bed during the spring months ; *Hydrangea hortensis*, which is said to bear blue flowers when grown in heath-soil ; the species of *Mahonia*, rich and interesting at all seasons of the year ; and the *Laurustinus*, than which few plants can be better fitted for our purpose.

Of half-hardy plants, a long list might be given. We shall only note the genus *Fuchsia* and *Leycesteria formosa*, because they will bear our winters with but a trifling protection to the roots, and spring up, anew, each spring, with augmented vigour. We hope, ere many years pass by, to see hardy ornamental shrubs as much employed in grouping as the half-hardy suffruticose species, which are now so generally planted in flower-gardens.

HINTS ON POTTING AND PLANTING.

Among the many errors to which amateurs and the less considerate class of gardeners are liable, there is none that so much needs exposure, on account of the bad consequences it entails, as that of burying the roots of plants too deeply below the surface of the soil. Instances are perpetually occuring beneath our observation in which trees and shrubs are completely destroyed by this injudicious and unphilosophical practice ; and the cases are still more numerous wherein others are brought into a state of unhealthiness, which alike puzzles and annoys the inexperienced cultivator.

The evils of deep planting are never essentially different, however much they may be modified by circumstances. The influence of the air is as necessary to prepare or purify the aliment imbibed by the roots of plants, as it is to elaborate the sap exposed by their leaves. And accordingly, it matters not whether excessive drought, baking the surface of the earth, or extreme saturation, preventing the access or neutralizing the effects of other elements, or remoteness from the top of the ground, is the cause of the exclusion of air ; all are similarly and almost equally prejudicial.

But other detriment is caused to plants whose roots lie too far beneath the surface, in the fact that they absorb too much moisture and grow too rapidly and luxuriantly. A specimen which derives its sources of nourishment below the action of the atmosphere, necessarily receives a larger and more constant supply than it would if the soil in which the roots grew were subjected to the agency of evaporation ; and hence its developments will be unnaturally increased. In regard to fruit or flower-bearing species, the injury produced by such a circumstance is strikingly obvious ; exuberance of growth being invariably inimical to fertility. With trees, however, the mischief may not be quite so apparent. Still, extravagant development generally begets disease, and always proves in some degree destructive to symmetry and beauty.

A damage of a peculiar nature is sustained by exotic plants that are at all tender, from having their roots too deeply buried in the soil. Besides being rendered less prolific, and having their blooming propensities converted into growing ones, their shoots, by being so luxuriant and full of fluid, are never thoroughly matured, and therefore suffer from the slightest frost, and are frequently killed ere the close of the winter. It is thus that many persons, thinking to protect the roots by planting them deeply, occasion the partial or total loss of the branches.

Deep planting is, consequently, detrimental in every case ; but more harmful to flowering or fruiting plants than to forest trees, and still more so to species that are not perfectly hardy. Nevertheless, people are in the habit of committing this error, either heedlessly or from one of two or three reasons which we shall now explain and refute.

The most common motive for planting specimens deeper than they ought to be planted, is that they may not be blown about by wind, or require artificial support. It is properly assumed that any kind of stake applied to a plant is objectionable where it can be dispensed with, on account of being displeasing to the eye. Yet, the old adage, that of two evils the least should be chosen, is applicable here as well as in more important things ; especially as the trifling evil of staking is of short duration, while that of deep planting is constantly becoming worse, and ceases only with the existence of the plant. It is thus demonstrable that to plant deeply with the view of avoiding support by stakes, is erroneous in the extreme.

Another and strong inducement to plant too deeply is the avoidance of drought. Specimens whose roots lie near the surface are, it is presumed, more likely to be injured by dryness in summer, than those which are able to draw moisture from lower and more certain sources. And, on a superficial glance at the question, this assumption has considerable weight. Drought, however, is a condition which can be easily remedied the first season, and will not probably occur afterwards, since the roots will naturally seek more secure resources ; while the disadvantages of deep planting are, as we have before said, permanent. Much as the truth may be doubted, there is ever more danger to be apprehended from unnecessary moisture than from drought, because the latter is neither so prejudicial nor so difficult to obviate.

A third incentive to deep planting, is to protect the roots of plants that are in the least inclined to be tender from frost. It is forgotten, however, that by this proceeding the vital part of the plant, which is the base of its stem, is made far more susceptible of damage in consequence of being filled with fluids, and that the branches are almost sure to suffer. The more rational way is to plant near the surface, so as to bring the plant into a hardened condition by the approach of winter, and then, if necessary, to shelter the roots by artificial mulching.

It is hardly worth while adverting to the opinion that comparatively deep planting is essential, to prevent the roots from receiving detriment when the ground is cleared or dug around them. Very few roots, indeed, will be so immediately on the surface as to be hurt by the hoe; and if digging is indispensable, the severance or disturbance of a small portion of roots is assuredly preferable to having the whole in an unhealthy state.

Having pointed out, thus explicitly, the evils of deep planting, and showed that the circumstances which are supposed to justify it are all overruled by others of greater moment, we shall describe the sort of planting that we advocate, premising that it is all departures from this which we denounce and deprecate.

Between the stem or heart of every flowering plant, whatever may be its nature, and its roots, there exists a definitive interspace or point of connexion which is termed the collum, collar, or neck. It is this collar which should be taken as a guide in all kinds of planting, (some culinary vegetables perhaps excepted), and it ought always, if possible, to be precisely on the surface of the ground. When practicable, as in the case of certain shrubs and trees, it may even be a little above the earth, and should never be buried beneath it beyond what is absolutely necessary to secure the plant in its position. Here, then, is a simple criterion, which all persons may understand. If the collar is placed below the earth, and in exact proportion to the depth at which it is plunged, the plant will assuredly be injured, to a greater or less extent. But if the specimen is planted so that the collar is just upon or above the surface of the ground, fertility, health, and hardihood, will be the natural and necessary results, provided everything else is alike favourable.

Sometimes, however, where the greatest care has been exercised in planting on the surface, the evils of an opposite course are incautiously realized by applying a quantity of fresh soil to the plot previously planted. It is a very common practice with amateurs who have small gardens, when their plants are not thriving as they would wish them, to procure new earth and spread it over the surface to the depth of three or six inches, or even a foot. The inevitable consequence is, that their shrubs and trees are spoiled, or perish.

Nor are gardeners exempted from the same fault, though they do not fall into it exactly in a similar manner. When alterations are made in a place, and additional earth has to be placed on a spot containing trees and shrubs, their collar is often thoughtlessly buried to any required depth, and they are expected to go on flourishing as usual. A very short period, however, serves to convince the operator that he has endangered the vigour, and even the life of his plants.

Nearly all that we have thus advanced is applicable, with a slight alteration, to potted plants. Heaths, New Holland species, and, indeed, every sort of exotic shrub, grows and blooms better when its collar is above the soil, so that the trunk of the principal roots is just visible. We always consider it a mark of a skilful cultivator, when the outline of the ball of earth which the plant had while in a previous pot, is perceptible after it has been shifted into a larger one, and is not buried as is most usually done. It is exceedingly doubtful whether the practice of renewing the surface soil of plants that are not shifted at the periodical potting be not open to all the objections we have urged against deep planting.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR OCTOBER.

Ae′rides cri′spum. The same species lately figured in our Magazine under the name of *A. Brookii*, and to which, it appears, Mr. Bateman had inadvertently applied that title, under the belief that it had not been previously described. Dr. Lindley, however, identifies it with the *A. crispum* of his work on Orchidaceæ, and it must, therefore, in future, bear that appellation. *Bot. Reg.* 55.

Dendro‵bium macra′nthum. In figuring this splendid plant, Sir W. J. Hooker suggests that the name of *D. macrophyllum*, which it has heretofore been known by, must be a misprint for *D. macranthum*. This was at first our impression, and we noticed it originally by the latter name; but altered it to *D. macrophyllum* on the authority of Dr. Lindley, as occurring in the Botanical Register. We now await further explanations. *Bot. Mag.* 3970.

Echinoca′ctus centete‵rius. "This has been for some time cultivated in the Royal Botanic Gardens of Kew, under the name here adopted. If it be the same with the *E. centeterius* of Lehmann and Pfeiffer, the plant from which the latter author's description was made was but young, for it is mentioned as two inches and three-quarters high, and three inches broad, with flowers an inch and a half in diameter. In other respects, the two plants appear to be the same. The best of descriptions, however, give but an imperfect idea of the distinguishing marks in this extensive and curious family. In the specimen before us, the height is above six inches, and the breadth somewhat less. The flowers are copious, five to seven or eight on the summit of the plant; each is nearly three inches across; the petals are deep straw colour, with a reddish streak down the centre. The filaments are reddish, and the anthers yellow." It is handsome, and flowers abundantly in July. *Bot. Mag.* 3974.

Gloxi′nia tubiflo‵ra. A remarkable new species, which "seems to have nearly as strong a claim to be considered a *Gesnera* as a *Gloxinia*, or, rather, it appears almost to unite the two genera. It is one of the many interesting novelties reared by Mr. Moore, of the Glasnevin Botanic Garden, from seeds sent by Mr. Tweedie from Buenos Ayres. It is probable he obtained the seeds from South Brazil, or, it has been suspected, from Paraguay." The plant has short stems, opposite oblong leaves, and graceful terminal panicles of flowers. These last are white and downy, with a "tube four inches long, a little enlarged and curved upwards, with a very conspicuous broad spur or gibbosity; the limb an inch and a half broad, spreading, equally five-lobed." The length of the tube of the blossoms, and their delicate whiteness, will render the species exceedingly desirable. *Bot. Mag.* 3971.

Helle′borus oly′mpicus. "A native of the Bithynian Olympus, whence it was sent to the Horticultural Society by Mr. Sandison, her Majesty's consul at Brusa." Its leaves are palmate and thick, and the leaflets are finely toothed. The flowers are large, greenish-white, and appearing late in the autumn. "It is a hardy herbaceous plant, requiring a rather moist situation, and peat soil to grow in. It is easily increased by dividing the old plants when in a dormant state, or by seeds, which should be sown, directly they are ripe, in pans filled with light rich soil." *Bot. Reg.* 58.

INDIGO'FERA DO'SUA. Referred by Mr. Bentham to the Indian species of the above name, although differing materially in appearance. It is said, however, to be exceedingly variable in character. The plant is "very pretty when in flower, forming a struggling bush, whose bright deep rose-coloured blossoms are highly ornamental. It has been raised in the garden of the Horticultural Society from seeds sent to England by Dr. Falconer from the Botanical Garden of Saharunpur, and presented by the Honourable Court of Directors of the East India Company. It flowered for the first time in May, 1840; but subsequently it has produced blossoms occasionally through the summer. What gives it its chief value, is that it appears to be a shrub sufficiently hardy to stand an ordinary winter in the open border, and growing vigorously in any good rich garden soil. It flowers freely during the months of July and August in the open border, but earlier if kept in the greenhouse. It is easily increased from cuttings of the young wood, treated in the ordinary way, or by seeds." *Bot. Reg.* 57.

MAMMILLA'RIA PYCNACA'NTHA. "From the collection in the Royal Gardens of Kew: a native, it is said, of the neighbourhood of Oaxaca, Mexico. The plant, figured by Lehmann, represents a young plant, more elongated than usual. In other respects, it quite accords with our specimens. When well grown, the form is almost globose. It flowers copiously, in July, from the summit, and numerous offsets are produced also from the apex, by which the plant may be easily increased." The flowers are five or six in number, "opening at a time, on the top of the plant, and making a handsome appearance when spreading under the influence of the sun; of a deep sulphur-yellow colour, two and a half or three inches in diameter." *Bot. Mag.* 3972.

STA'TICE MONOPE'TALA; *var.* DENUDA'TA. The *S. monopetala* is an interesting evergreen shrub, and "that now before us is a well-marked variety, but nothing more, having smaller and paler flowers, a more 'drawn up' manner of growth, broader leaves, somewhat wavy at the edge, and a much smaller quantity of calcareous scurf. No trace of it is found in books, and it is probably of garden origin. The Horticultural Society received it from the Botanic Garden of Leyden under the erroneous name of *S. suffruticosa.* It is nearly hardy, requiring only a slight protection during winter, when planted in the open border, but it suffers from damp. It flowers during the autumn months, and grows freely in any rich light soil, and is easily increased by cuttings of the young wood, treated in the ordinary way." The blossoms are light pinkish-purple. *Bot. Reg.* 59.

STE'LIS ATROPURPU'REA. "This new *Stelis* was sent by Mr. Parkinson from Mexico, to his Grace the late Duke of Bedford, and it flowered in the orchidaceous house of that nobleman at Woburn, in February, 1839. It has little beauty to recommend it in comparison with many of this family of plants, which are such universal favourites." The flowers are borne on a long half-drooping spike, and are of a dark blood colour. They are small, but showy. *Bot. Mag.* 3975.

OPERATIONS FOR NOVEMBER.

As the heat of the sun has now ceased to be felt with any power, and evaporation is carried forward with extreme slowness, all plants under artificial culture will require to be cautiously supplied with moisture, according to the season. Evaporation is the only sure test of the amount of water requisite for plants in pots; and when that is almost at a stand-still, it is certain that very little water can be needed.

There is another reason, however, why plants should have scarcely any fluid furnished to them at this period, and that is that they have now no young wood to nourish and develop. When growing, they demand a double supply of nourishment; but while dormant, their necessities are of the most limited description. And to give them food which they do not need, is a very ready way of inducing disease, or bringing them into a generally unhealthy condition.

Little or no water being thus wanted, the application of heat, beyond what is necessary to guard the plants from frost, must be improper and prejudicial. If plants are not growing, and are not wished to grow, and if by consequence they are watered very scantily, artificial heat must bring on evaporation and dryness to an injurious degree, and, at the same time, incite them to begin growing. It may have become a trite observation with us, but we must ever continue to insist that if plants are less watered in winter, they will remain more inactive, and be less liable to be frozen, while if frost is just prevented from affecting them, they will grow and blossom much finer and better than they would if stimulated in winter.

Damp weather without, which is almost inevitable in November, will render it somewhat difficult to keep the atmosphere of greenhouses and frames sufficiently dry. The least moisture in the external air should be enough to deter the cultivator from opening any of his houses, though the temperature may be naturally high. And whenever the slightest tendency to decay or mouldiness is observed in any plant, it should be duly checked, and its causes avoided. All dead or rotten leaves should be discarded as a pestilence, and never suffered to remain either on the plants or in their neighbourhood.

Where bark is employed to produce bottom-heat in stoves and orchidaceous houses, it should, if possible, be taken away during winter, as it must necessarily tend to keep the atmosphere moist. If it cannot be removed conveniently, care should be taken that it become old and powerless at this season, for nothing could be more harmful than such a stimulus as fermenting bark. During such weather as will not permit the progress of out-door operations, it will be desirable to have every description of stove plants freed from insects, and their leaves cleanly sponged ; not that they should ever be allowed to get dirty, but because it is prudent, when there is time enough to spare, to clean them thoroughly late in the autumn, the leaves being then less tender and susceptible of injury than at any other period.

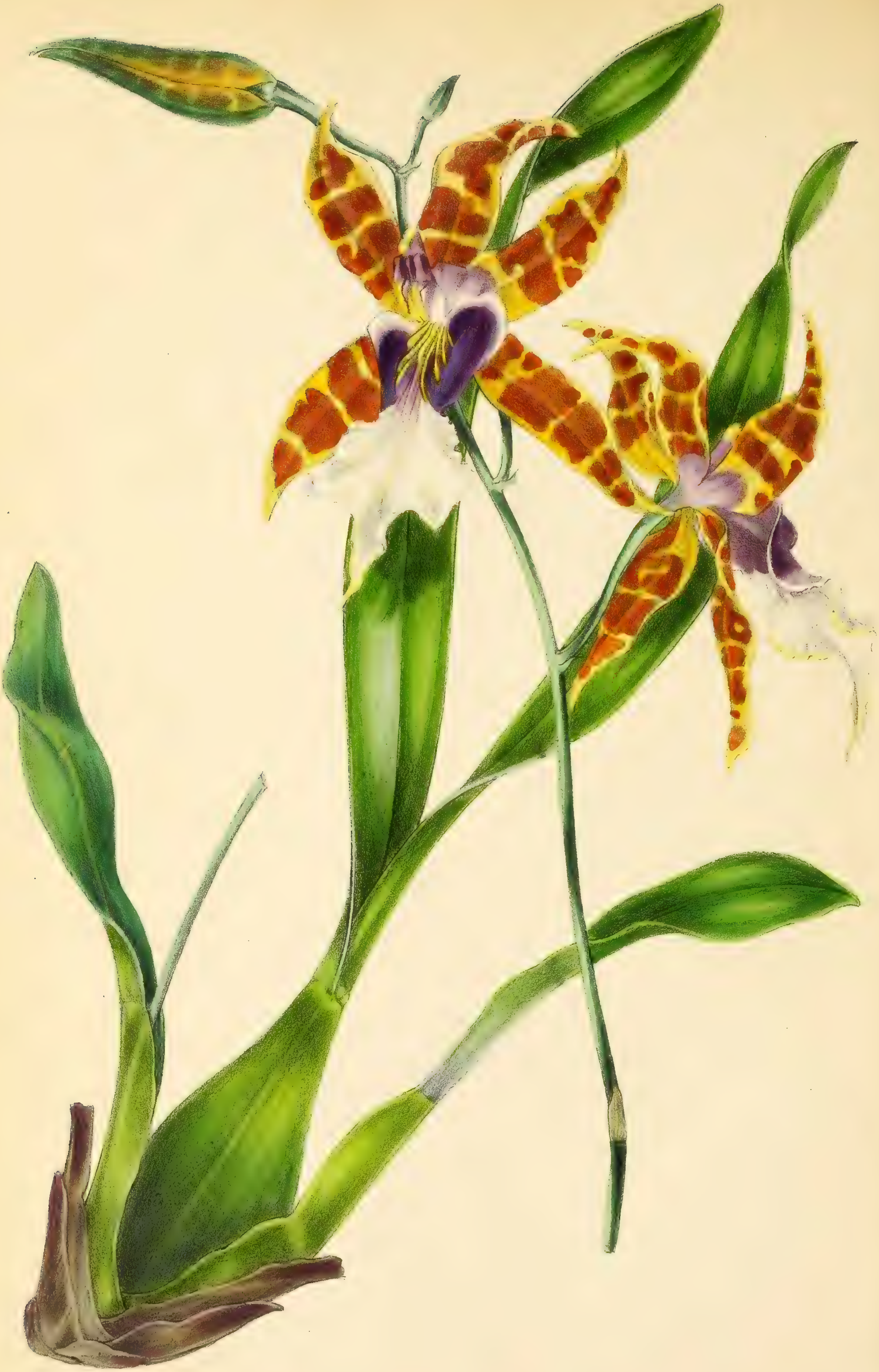
All those climbers, whether in the greenhouse or stove, that require an annual pruning in the winter, should now be attended to. After they have been pruned, those which are not evergreen may have their branches collected into a bundle, and fastened under the rafters. They will then obstruct the light less, and light is of the greatest importance in winter. Of course when the spring arrives, and there is the least sign of motion in their buds, they must be spread out again in their proper places.

Cape bulbs, Hyacinths, Narcissuses, &c., that have not yet been potted, should be forthwith planted. Hyacinths and their allies ought always to be plunged in bark or some very light soil before they are placed in the forcing-house or in glasses. They thus commence growing more favourably than when the bulbs are exposed ; and the slight blanching which their leaves receive is speedily recovered. They need not be plunged deeper than two or three inches below the surface, and should be removed as soon as they have fairly started, that they may not be subjected to frost.

In the open ground, this is the season for effecting alterations, or for planting. All ground work that involves planting should be done immediately, for it is desirable that the trees or shrubs should have time to settle and establish themselves ere severe frosts set in. No specimen ought to be pruned at the time of planting, as it is imprudent to impose an additional tax on its energies while it has so many to contend with. We mean that it should be allowed time to recover from the wounds its roots necessarily receive before its branches are wounded likewise.

Beds that have been filled with summer flowers being now vacant, may be turned up, or have their soil renewed ; and some of them can be planted with bulbs for spring flowering. Hyacinths, if grown in beds, would make an admirable display in spring, and are by no means duly valued as an out-door ornament. A considerable proportion of sand and cow-dung should be put in the soil prepared for their reception.

Ornamental climbers can now be pruned and dressed. Some kinds, such as Tecomas, will bloom much more finely without any pruning ; unless it be their really superfluous shoots. The species of *Clematis* and the jasmine, may, on the other hand, be rather closely pruned with advantage. Both for appearance and convenience, trellises are preferable to plain walls for supporting climbers.



lden. del. & Lith.

Miltonia Clowesii.

MILTÒNIA CLÒWESII.

(Mr. Clowes's Miltonia.)

Class.
GYNANDRIA.

Order.
MONANDRIA.

Natural Order.
ORCHIDĀCEÆ.

Generic Character.—*Perianth* showy. *Petals* and *sepals* revolute, lateral ones connate at the base, sessile, similar. *Labellum* largest, dilated, undivided, sessile, connate with the column, lanceolate at the base. *Column* short, semi-cylindrical, eared at the summit. *Pollen-masses* two, with an oblong, adnate caudicula.

Specific Character.—*Plant* epiphytal. *Pseudo-bulbs* oval, two-leaved. *Leaves* ensiform, narrow, erect, longer than the scape. *Raceme* few-flowered, lax. *Bracts* small, setaceous. *Sepals* and *petals* lanceolate, equal. *Labellum* cordate, constricted in the middle, acute, with five unequal, abrupt lamellæ at the base.

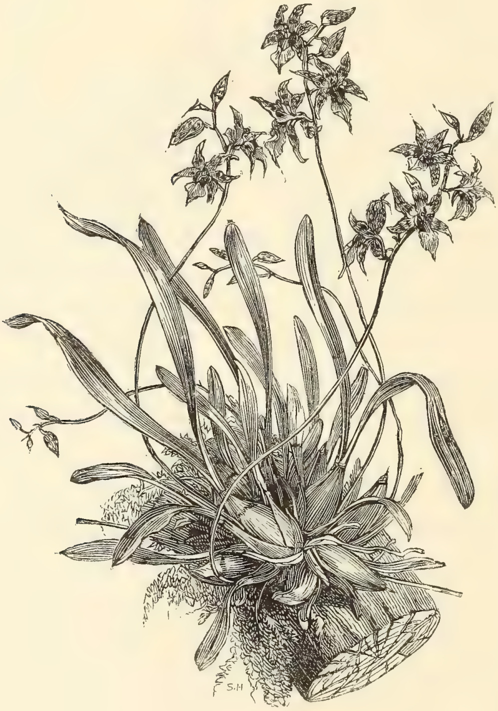
This very beautiful species of *Miltonia* was, we believe, introduced by J. Clowes, Esq., of Broughton Hall, near Manchester, and after that gentleman, who is a very zealous collector and cultivator of the tribe, it has appropriately been named.

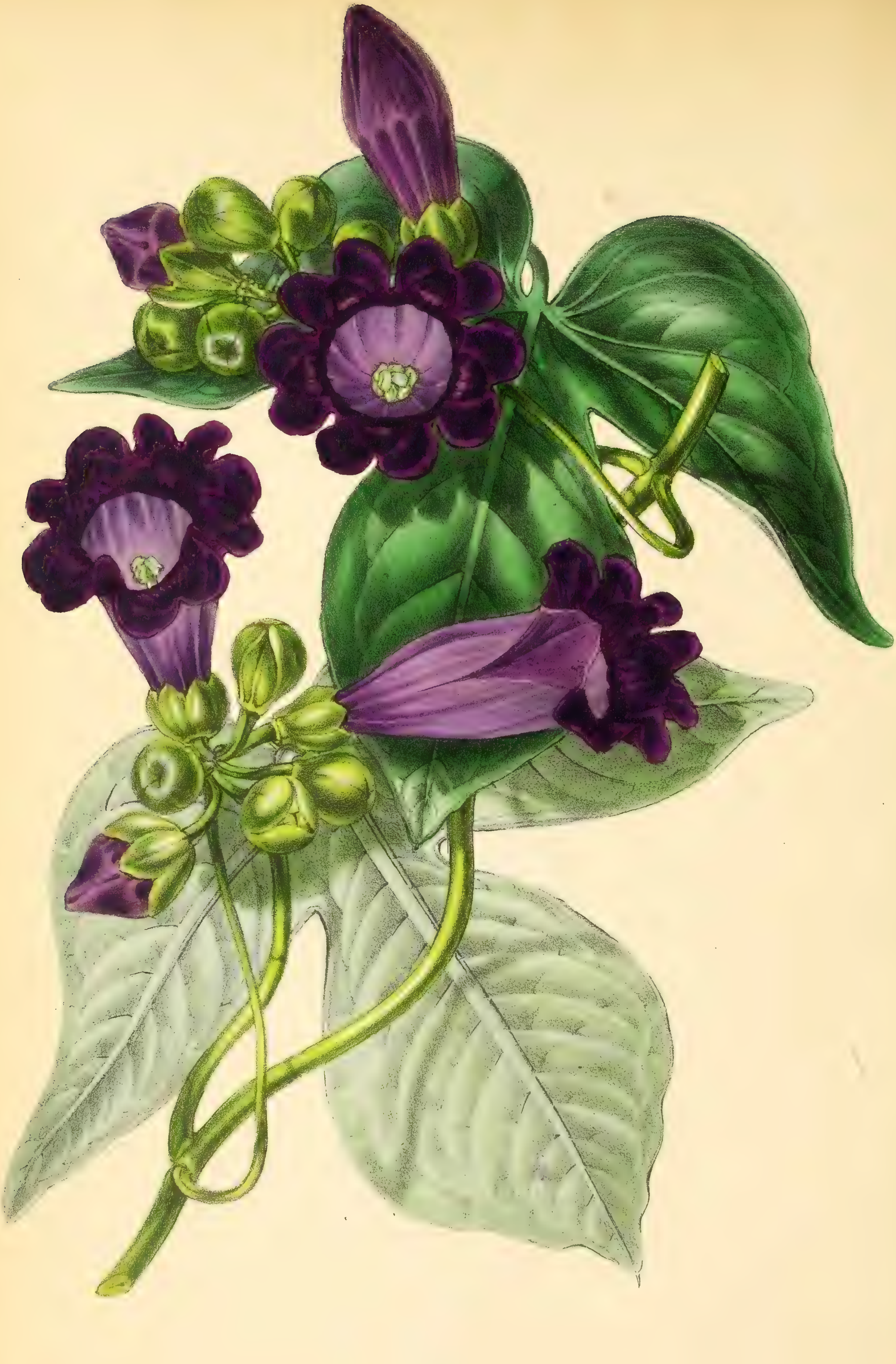
It approaches nearest to *M. candida*, which is, perhaps, the finest member of the genus, and resembles that species in several prominent characteristics. Its pseudo-bulbs and leaves are somewhat similar, except that the former are rather more tapering towards the summit, and mostly a trifle greener. The foliage partakes, too, of the partial yellow tint of that of *M. candida*, though in neither of these is it so marked as in *M. spectabilis*. The flowers are, moreover, exceedingly like those of *M. candida* in general conformation, only being a very little smaller. Their sepals and petals are, again, of nearly the same colours, having broad brown blotches on a yellowish ground. But the structure of the lip is altogether different, and its hues are quite peculiar. It is very considerably compressed in the middle, by the folding back of the edges; and this construction almost gives it the appearance of being composed of two parts. The point, besides, is greatly attenuated. At first, it is said to be perfectly white; but it afterwards acquires, towards the base, that lovely violet and pinkish tint exhibited in the drawing.

Like *M. candida*, it is one of the most desirable of Orchidaceæ, on account of its flowering through the dull months of October, November, and December. It even blooms longer than its very prolific ally, for a specimen at Messrs. Rollisson's, Tooting, has been in blossom since the end of September, and has yet several perfect flowers. In regard to the number of its racemes, however, it does not seem to equal *M. candida.*

It may be cultivated like the pseudo-bulbous class of Oncidiums, requiring to be potted in turfy heath-mould and potsherds, well mixed and efficiently drained. A very slight depth of soil is needed, and the pot can be principally filled by placing a smaller one in its centre, in an inverted position. It does not require a great heat, and but a scanty supply of water in winter.

Our species is a native of Brazil, and we had the accompanying figure, with the annexed woodcut, made from Messrs. Loddiges, of Hackney, in October 1840.





S. Holden del & Lith.

Pharbitis ostrina.

PHARBÌTIS OSTRÌNA.

(Royal purple Gaybine.)

Class.
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
CONVOLVULÀCEÆ.

GENERIC CHARACTER.—*Calyx* of five sepals. *Corolla* campanulate, or campanulately funnel-shaped. *Style* one. *Stigma* capitately granulate. *Ovary* three or rarely four-celled; cells two-seeded.—*Don's Gard. and Botany.*

SPECIFIC CHARACTER.—*Plant* a climbing herbaceous perennial. *Roots* tuberous. *Leaves* hastate, three-parted, smooth, glaucescent beneath; lobes ovate, obtusely acuminate. *Peduncles* three, four, or more flowered. *Calyx* with smooth and very obtuse segments. *Corolla* funnel-shaped; limb obsoletely ten-lobed; lobes roundish; deep purple.

THE genus *Pharbitis* is one of the many sections into which the old group *Convolvulus* has been divided; and though these separations have tended materially to confuse and annoy cultivators, they are now generally adopted by botanists. It is the genus *Ipomœa*, however, which has chiefly contributed to the establishment of the present race; and we may here mention that *Ipomœa Learii* has been determined a genuine *Pharbitis.*

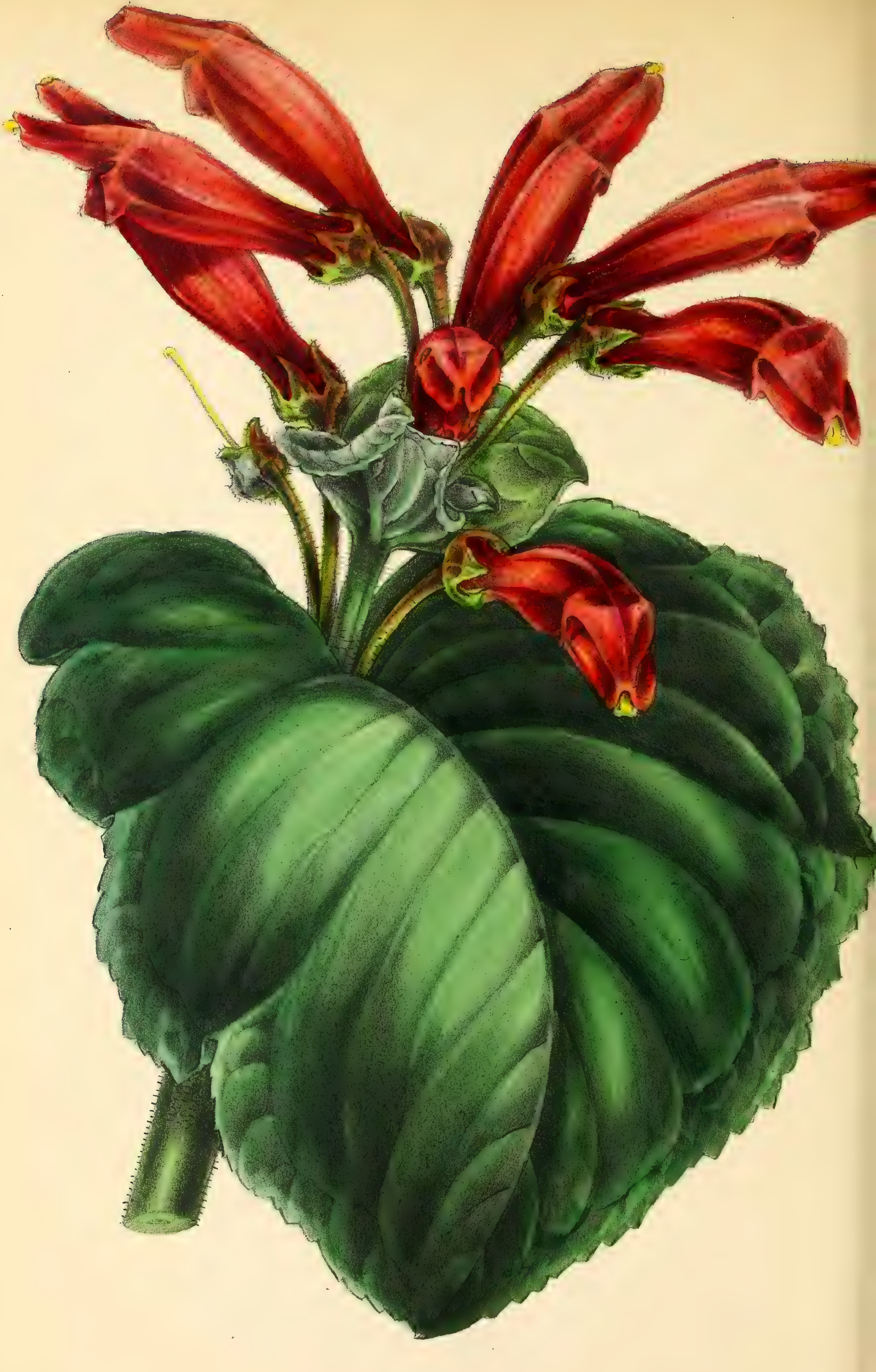
Dr. Lindley has referred the handsome plant now figured to *Pharbitis*, in consequence of its having a three-celled ovary, with two ovules in each cell; though, he says, the habit is more like that of *Batatas*, which is another division of the same class.

It was imported from Cuba, about three years ago, by Messrs. Loddiges, in one of whose stoves it blossomed profusely during the summer months of 1841. At that time our artist prepared the figures here given. Commencing to bloom towards the end of May, it continued in great beauty for a lengthened period; indeed, till the decline of the season.

Its character is that of a tuberous-rooted perennial, with climbing stems, which ramble fifteen or twenty feet each year, and decay, for the most part, every autumn. The leaves are very distinctly divided into three ovate-lobes, which are quite smooth, deep green, and almost shining on the upper surface, and pale with a whitish glaucous appearance beneath. The clusters of flowers spring from a point opposite or near the base of the leaf-stalks, and are composed of three, four, or an indefinite number of showy blossoms. The latter are rather small, with a long tube, and an undulated limb; but their colour, which is a deep sanguine purple, is particularly rich.

The species is readily cultivated; requiring a rather nutritive loamy soil, and a moderately large pot. As it seems to flourish best in a warm moist stove, it is a favourable object for training over the roof of an Orchidaceous-house, where its leaves will afford some shade to the plants growing below them; and for such a purpose it is rendered especially suitable by the annual decay of its stems. During winter, it ought, however, to be kept in a drier place; for all tuberous-rooted plants bloom in a superior manner if they are kept thoroughly torpid for two or three of the coldest months of the year. It is not, probably, well adapted for training over a low circular trellis, though this method might be tried with propriety.

Its multiplication is effected by cuttings, which should be taken off early in the season, that they may form sufficiently large tubers to prevent them from dying in the following winter. Extreme caution is necessary in regard to supplying the cuttings with moisture.



S. Holden. del. & Lith.

Gesnera lateritia.

GESNÈRA LATERÍTIA.

(Brick-red flowered Gesnera.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Orde .
GESNERÀCEÆ.

Generic Character.—*Calyx* adnate to the ovary; limb nearly equally five-lobed, free. *Corolla* semi-superior, tubular, with five gibbosities at the base; limb sub-bilabiate; upper lip drawn out, emarginately two-lobed; lower lip three-lobed. *Stamens* didynamous, with the rudiment of a fifth behind; anthers at first cohering into a round head. *Glands* five, or fewer, around the ovary. *Capsule* dry in the calyx, one-celled, incompletely two-valved; placentas two, parietal, many-seeded. *Seeds* scrobiform.—*Don's Gard. and Botany.*

Specific Character.—*Plant* an herbaceous perennial. *Leaves* roundly ovate, cordate, rugose, crenate, hairy. *Flowers* axillary, solitary, terminal, in pairs. *Bracts* sessile, stem-clasping, plain. *Corolla* downy; upper lip oblong, concave, two-lobed; lower one truncate.

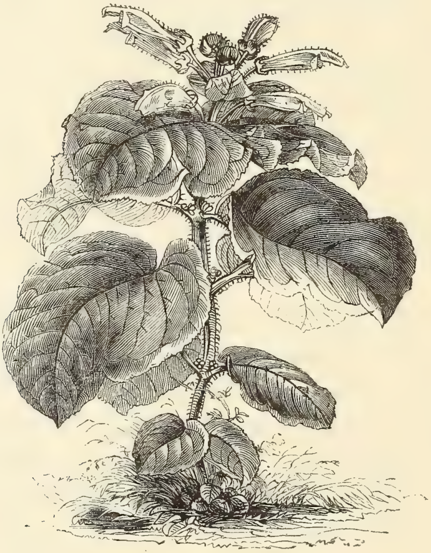
Of the very ornamental genus *Gesnera*, this constitutes one of the most desirable features, on account of its combining unusual dwarfness and compactness with the most ample and noble foliage, and particularly brilliant flowers. It was brought to this country from Brazil eight or nine years ago; and has lately been more copiously received and propagated by Mr. Low, of Clapton, in whose nursery the subject of our figure bloomed splendidly through the months of July, August, and September, 1841.

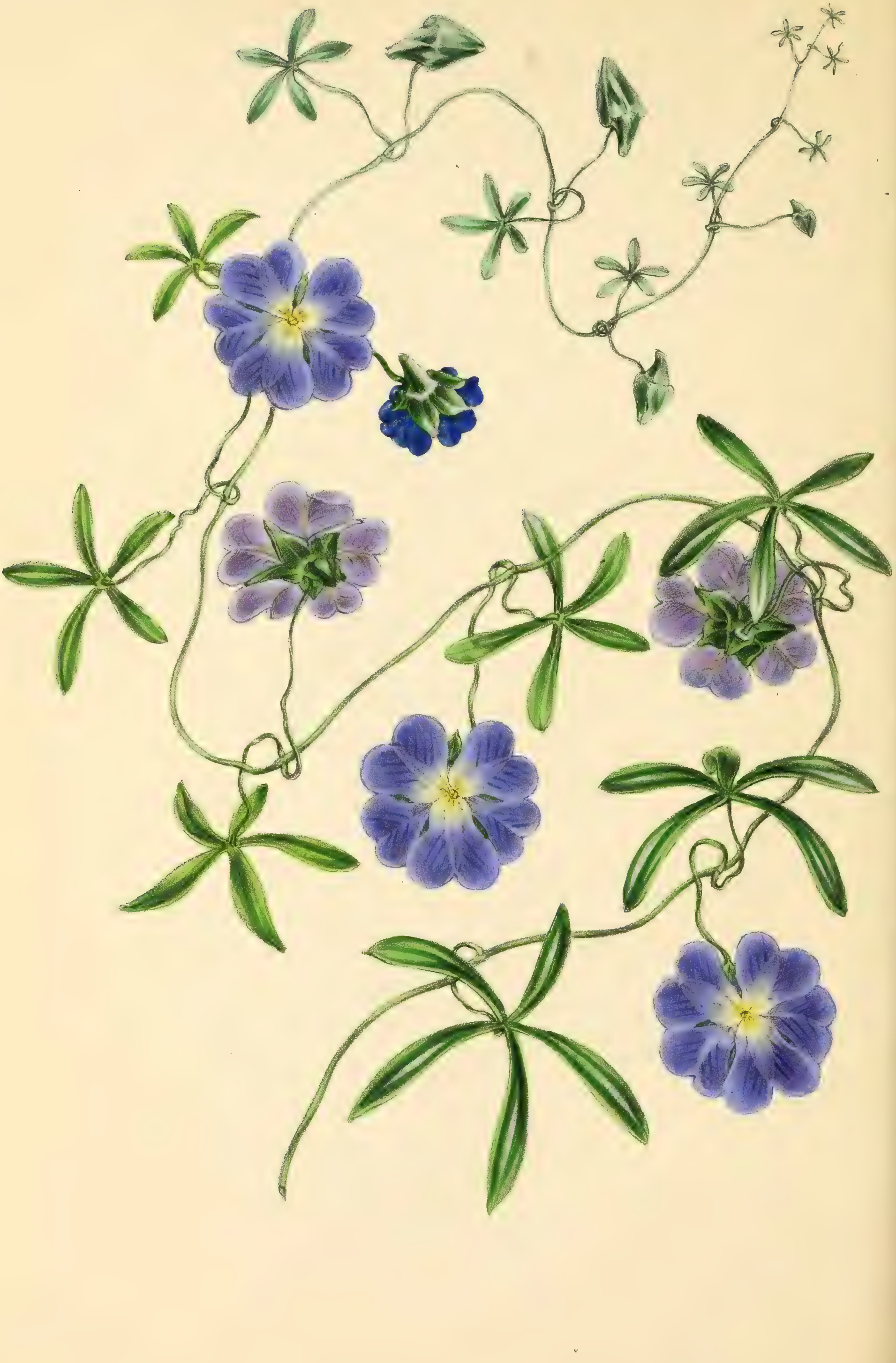
Respecting its affinities, Dr. Lindley remarks, in the Botanical Register, that it "forms one of the set of *G. bulbosa*, which is plainly distinguished by the oblique orifice of the corolla, the long emarginate upper lip, and the very small lobes of the lower lip. It is most nearly allied to *G. faucialis*, from which it differs in the leaves being more round, the flowers smaller, the flower-stalks longer, the base of the upper lip of the corolla as wide as its apex, the narrow orifice of the tube, and the truncated narrow middle lobe of the lower lip."

A more popular and easy method of recognising this species among all its congeners, is in the peculiar lowness and closeness of its habitude, and the great size of its foliage. This last is commonly found very near the base of the stem, and clothes it far more completely, and with less intervals, than any other *Gesnera* with which we are acquainted. The stalks of its flowers are likewise usually covered with a conspicuous red or reddish crimson down.

Its culture is in no degree dissimilar to that of its allies. Cuttings should be taken from the young shoots, as soon as they are two or three inches long, in the same way as from Dahlias; only not removing the base, but leaving it attached to the old tuber, that fresh stems may be generated. If struck rapidly in a brisk heat, they will form excellent blooming plants in the following season, and will probably flower the same year. The plant demands a rather generous treatment, in regard to soil and atmospheric moisture. The compost in which it is potted should be enriched with leaf mould or decayed manure; and it must not be stinted for pot room. To retain around it a congenial humidity, it should be plunged in fermenting bark, or some such material, so that the supply of moisture may not depend on variable sources. Thus managed, it is a most valuable stove plant, and will even bloom through the month of November under favourable circumstances. The tubers should be well preserved from damp during the resting period.

The engraving below will supply a more correct idea of the character of the plant than could be furnished in the coloured representation.





S. Holden. del. & Lith

Tropæolum azureum.

TROPÆ̀OLUM AZÙREUM.

(Blue-flowered Indian Cress.)

Class.
OCTANDRIA.

Order.
MONOGYNIA.

Natural Order.
TROPÆOLÀCEÆ.

Generic Character.—*Calyx* five-parted; upper lobe furnished with a spur. *Petals* five, unequal; three lower ones smallest, or vanished altogether. *Stamens* eight, free from the base. *Carpels* three, somewhat erose, kidney-shaped, indehiscent, furrowed, roundish. *Seed* large, filling the cell.—*Don's Gard. and Botany.*

Specific Character.—*Plant* an herbaceous perennial. *Root* tuberous. *Stems* slender, climbing, spotted. *Leaves* five-parted, segments equal, linear-lanceolate, obtuse or slightly acute, smooth, pale beneath *Calyx* with a short spur; segments nearly ovate, acute, subequal. *Petals* five, obovate, violet-blue, white at the base, almost equal, deeply indented in the centre at the margin.

For a long time past there has been a considerable eagerness manifested in the floricultural world to possess a blue-flowered *Tropæolum*, which had been described by travellers, but of which many even questioned the existence. Expectations were repeatedly raised by individuals who imagined they had received it; but these were as frequently foiled; and it was, at length, with some surprise that an authentic flowering specimen was regarded in the present autumn.

Messrs. Veitch and Son, of Mount Radford Nursery, near Exeter, have the credit of introducing this most delightful novelty. It was gathered by Mr. William Lobb, a collector in the employ of these gentlemen, at a place called Cuesta Dormeda, about sixteen leagues from Valparaiso. It appears to have been found by him in the beginning of February, and arrived at Exeter in June last, opening its flowers in the end of September. Specimens at Mr. Low's, Clapton, and Messrs. Rollisson's, Tooting, are yet beautifully in blossom.

In its habit, it is very slender, not much unlike *T. brachyceras*, and appears easily known by its leaves. These are small, and almost equally separated into five segments, which are extremely narrow, inclining to a linear form, with a trifling tendency to become lanceolate, and of a markedly pale green tint. The stems are, in addition, a little spotted. The flowers are altogether peculiar in form as well as colour. Their five petals scarcely differ in size, radiating almost as regularly from the centre as those of a common Primrose, and precisely similar in their exterior shape. They are, originally, of a deep violet hue, passing to whitish in the middle, and fading to a shade lighter after they have been opened a few days. The spur of the calyx is short, blunt, very dark green, and a little spotted.

Whether the natural period of its flowering can be determined by what has yet been witnessed, is a matter of doubt. It seems likely, nevertheless, as many plants have bloomed at the same time, that it does blossom in the autumn; and if so, its value will be materially increased. It evidently flowers as abundantly as the remarkably fertile *T. tricolorum*, and will doubtless be as much prized, even after rarity has ceased to operate.

There can be no difficulty about its management, where that of *T. tricolorum* is understood. As we have long since observed, it is desirable to let a part of the tubers be exposed for a year or two, while growing; since they swell to unusual dimensions under such treatment. Afterwards, however, they should be entirely covered by the soil, because the stems are rendered stronger by the seclusion of the tubers from light. They will flourish best in a small pot, and may be preserved from extreme drought by placing their pot within a larger one, and filling up the interspace with damp sand or moss.

Cuttings root tardily, but they will succeed better in a cool, airy greenhouse than in a warmer or confined place.

GARDENING AS A SCIENCE.

No. XI.—FIRE.

It is a curious circumstance that *Fire* was by the ancients believed to be an *element*—that is, a simple substance, uncombined with any other portion of matter. In the ordinary acceptation of the word, fire, as the product of combustion—that is, as the combined development of light and heat—involves a tissue of attractions and decompositions of the most intricate character: a few portions of this we propose to trace; but it will be the chief object of the article, however strange it may appear, to re-establish the elementary character on the basis of pure modern chemistry.

As applicable to the science and practice of Gardening, we shall attend principally to the economy of heat in furnaces and flues, but previously shall cite a few experimental facts, which the former observations upon the nature and properties of the gases may elucidate. After the discovery of oxygen gas by the chemists of last century, combustion and the development of flame were ascribed, by Lavoisier and his brethren in science, to the combination of oxygen with some inflammable base,—all aëriform fluids were deemed "compounds of ponderable bases with *light* and *heat*," and thus, when a union took place, the light and heat were extricated in the form of *fire*. The beautiful experiment of the combustion of a coil of iron wire in a bell-glass of oxygen, whereby a 'firework' of extreme brilliancy was displayed, not only afforded evidence, but clearly proved, that *iron* thus converted to an *oxide* had acquired a traceable increase of weight. Similar results followed the combustion of sulphur, phosphorus, and carbon: light and heat were developed, and the residuary compounds were sulphuric acid, phosphoric acid, and carbonic acid gas. The combustion of the diamond in oxygen gas was effected by Lavoisier, and has been repeated by other chemists; it proved that, as the product was a volume of carbonic acid, the diamond and pure carbon are chemically the same. In this experiment the product of combustion was heavier than the body consumed, exactly in proportion to the weight of the oxygen which had disappeared.

When oxygen and hydrogen gases are mixed together, they remain (in low temperatures) unaltered, though each is in an opposite state of electricity. If heat be applied, they gradually unite by electric affinity, and watery vapour is produced; by flame, or the electric spark, they are instantly exploded with violence; but if a stream of hydrogen gas pass through a fine jet pipe into a bell-glass, standing over mercury, filled previously with pure oxygen gas, no explosion will take place, provided the hydrogen be ignited the instant before the jet is inserted into the vessel of oxygen. The hydrogen will consume gradually, and water be formed and trickle down the sides of the bell.

Chlorine gas, if united with hydrogen in equal volumes, will combine chemically without heat, and form muriatic acid ; but if the mixed gases be exposed only to the direct solar ray, an explosion will frequently ensue. A jet of hydrogen gas, first inflamed and admitted into a glass vessel containing chlorine gas, will continue to burn till gradually the yellow colour of the latter will vanish, and muriatic acid gas be produced.

Thus, light and intense heat are evolved by the chemical union of two elastic fluids ; and the question, therefore, most naturally occurs—what is their source and origin ?

An apparatus, consisting of copper and zinc, or of platinum and zinc plates arranged in alternate order, constitutes what is termed a voltaic or galvanic battery. This instrument, excited by a diluted acid, composed of ninety-five parts of water and five parts of mixed nitric and sulphuric acids, will induce phenomena of light and heat of a grandeur and intensity altogether startling. Thus, in the experiments with a large instrument like the celebrated battery of Mr. Children,—" When gold, silver, zinc, and copper leaf were interposed between the poles, they were ignited and burned, and fine wires heated red or white hot according to their lengths and diameters. With an iron wire, the combustion is particularly brilliant. The extreme intensity of the *heat* in the arc of flame, produced between charcoal points, was made evident by exposing to it substances of difficult fusibility ; these melted, and others, infusible by ordinary methods, were thus liquified."

Now these luminous and powerful effects are produced by the attractions exerted between metallic surfaces in cells containing water slightly acidulated, throughout which there is not the slightest trace of visible light. How manifest, then, it is, that the fire so developed must lie hidden in the materials employed till it be revealed and brought into play by chemical action! and how stupendous must be the volume of this ethereal essence, when an apparatus of almost infinitely less power was proved by the experiments of Faraday to generate in the space of three minutes a stream of electricity equal in volume to that of a powerful flash of lightning! If, then, all natural and all known substances be replete with electricity, (for by this term it is yet customary to designate ethereal fire) ; if every act of percussion or friction disturb, and to a greater or less extent reveal it ; if the very air we breathe emit a flash of light when suddenly compressed, and every grain of common water be replete with it ; then we may safely infer the *elementary nature of fire*, since its origin must be the sun, and its depositary the globe and its waters.

The combustion of fuel which, practically, is of the most immediate importance to the gardener, is a process of great complexity. The prime agent, or exciter, is doubtless simple, but the elements upon which it acts are multifarious. Thus wood consists,—so far as analysis can decide,—of solid oxygen, hydrogen, and carbon. We say consists, because the results of the most refined experiments are oxygen *gas*, hydrogen *gas*, and charcoal; not that it would be correct to assert that wood, while it exists as such, is composed of those elements. Coal had doubtless its origin in *wood*, decomposed by the action of water under the surface of the earth. Coal varies much in its components; the basis, however, being, in the main, charcoal, with bituminous and earthy matter, varying according to the locality of the mine.

The common soldering or caking coal has been reduced by analysis to—

Carbon	,,	,,	75 28	per cent.
Hydrogen	,,	,,	4·18	,,
Nitrogen	,,	,,	15·96	,,
Oxygen	,,	,,	4·58	,,
			100·00	

When distilled in iron retorts, the products are the coal gas of illumination, tar, ammonia, water, and much fœtid sulphurous gas.

This coal cokes well, but if heated strongly, runs into clinker, and is liable to be suddenly extinguished.

The Staffordshire coal does not generally coke; it burns steadily without clinker, but abounds with much white-ash, which will effervesce with acids.

The best and most available fuel appears to be the Leicestershire *Moira* coal; it is very hard, and of difficult fracture, but burns steadily, never deceives the furnace man, and consumes entirely to a moderate quantity of grey ash.

The *economy of heat* is a point of importance in horticultural science; and so is that of time; but the chief and paramount considerations are the health and comfort of the labourer.

We do not discuss the merits of the various methods of producing and conveying heat, for a good and soundly-constructed brick flue and hot-water apparatus may equally be rendered costly or economical, by a due regulation of the fuel. Experience has proved that by employing common cinders and 'breese,' with an occasional lump of Moira left undisturbed, a steady heat is maintained for hours. At night a lump of 7 or 8lbs., pushed far toward the neck, another of less size laid on the ignited fuel, covering the whole with small screenings of sea-coal and cinders, and banking with wet ashes at the door, have prevented accident and entirely obviated night labour. The draught must of course be reduced by means of the ash-pit door, or chimney-damper; but with this precaution, a fire has been kept up, without re-kindling, during six weeks.

MANAGEMENT OF A FEW SPECIES OF BIGNONIA AND TECOMA.

The two genera specified in the above heading may, for all popular and practical objects, be classed together; so that if, in the following remarks, we speak of the treatment of either, we may be supposed to refer to both. They contain several species, which are scarcely ever met with in collections, but which are so exceedingly handsome that their rarity would be astonishing were it not accounted for by the belief that they are incapable of being easily cultivated to advantage, or so as to produce their showy inflorescence in any moderate quantity.

That such an opinion is altogether baseless, has been demonstrated to us by numerous examples. It evidently arises from ignorance of the nature or habits of these plants, and inattention to their peculiarities. If a *Bignonia* be treated as an ordinary climber, pruned, trimmed, and fastened closely to the trellis that supports it, the probability is that it will never bloom at all; or, if it should blossom, the flowers will be so scanty as to render it unworthy of being grown, at least in such a manner.

A great deal of the health and beauty of this tribe (as of all climbing plants) depends on the position of the pots or beds in which they are planted. It is commonly thought to be the height of folly to allow plants which flower tardily much room to extend their roots; and accordingly, confinement to comparatively small pots is considered a sovereign remedy for extreme infertility. This method has, however, so repeatedly failed, when unaccompanied with other and more important conditions, that it is strange to find how tenaciously its value is yet held by many cultivators.

Small pots can never, of themselves, promote productiveness, because they only cramp the roots, and prevent them from imbibing much nourishment. And though a stunted plant is generally the most prolific, its fertility is not a consequence, but a concomitant of its stuntedness. Warm, dry summers are notoriously conducive to the subsequent production of both flowers and fruit; but they unquestionably operate most beneficially on those plants whose roots are spread over the largest amount of surface, and not on such as have their roots circumscribed within very narrow limits.

As the question of how fertility may be best brought about is of the utmost moment, it deserves canvassing a little more closely. It is not materially connected, except relatively, with the amount of food absorbed and appropriated. A plant may have numberless fibrous roots, (which are its media of supply,) and almost boundless resources of nutriment, if those roots lie within the influence of light and air, and sustenance does not exceed the means of elaborating it duly; and yet remain in a state of the highest productiveness. Indeed, the wider the roots spread, provided they still keep within a trifling distance of the surface, the more fertile will the plant become.

It may, therefore, be laid down as an unalterable principle in culture of all kinds which has flowers or fruit for its object, that, not by confining or reducing the roots of plants (though both these practices are useful for the sake of restricting their growth within prescribed bounds) can fertility be increased; but by keeping the roots so near the top of the ground that the sun and air may act upon those roots, and upon the fluids they take up, and the soil in which these fluids are stored.

Keeping this point prominently before the mind, it will be instantly perceived that pots which are merely contracted in diameter, can simply check the expansion of plants placed in them, without at all affecting their produce, or only doing so prejudicially. With some tribes, it is true, a reduction of natural vigour is necessary, on account of the great space they would occupy, and also because of their tendency to emit superfluous branches. This is particularly the case with the beautiful shrubs, of larger growth, that adorn our greenhouses and stoves, with all those which it is wished should remain compact, but manifest a disposition to straggle, and with the annual or other species from which it is intended to save seed.

Culturists having observed that generous treatment has the direct effect of begetting exuberance, have resorted to the starving or opposite system, in the hope of obtaining contrary results. Here, however, they have not been sufficiently discriminative; since it is not highly favourable conditions (the idea embodied in the phrase generous treatment) that foster wantonness of development; but rather the mingling with them of such as are decidedly unpropitious. Moderately rich soil, and plenty of space for the roots, are, then, as we conceive, the best of all aids to culture; and their good influence is only counteracted by suffering that soil to be too deep, or too remote from atmospheric agency.

Applying these propositions, we think we have shown that small pots, of themselves, do not occasion the benefits ascribed to them; and, in fact, that they are really objectionable in the majority of instances. Where employed, they compel the better roots to descend to the bottom; and there, below the soil, and beyond the reach of air, they either lengthen themselves unduly without producing fibres, or gradually pass into a state of decay. That either of these circumstances must be exceedingly prejudicial, will be immediately admitted; for, wanting sufficient energy to cause vigorous or ordinary growth, no plant can possibly be in a condition to flower profusely.

In regard to many kinds of climbers, the above principles have a yet greater force. There are some species of these (and the groups before us furnish examples of the class) which will not bloom well till their stems and branches have reached a certain size and maturity. They must, in short, be vigorously established ere it is wise to attempt eliciting their flowering propensities. To check and retard their early development, therefore, by keeping them in narrow pots, is obviously absurd. Young specimens, obtained from the cuttings of fertile plants, may certainly be induced to flower earlier than seedlings, and in a far dwarfer and smaller state; but they will not bloom more abundantly, and doubtless not in perpetuity, from having their roots pent up in a more limited compass.

And this brings us to another position, which, like the last, is wound up in every rational system of culture, and is of nearly universal application. It is that plants in pots, or under artificial management in houses, should be grown before they are expected to flower much. What we mean may be made more clearly apparent by a slight amplification.

Every flowering specimen has particular dimensions, which it is believed or desired to attain, and beyond which it will not materially develop itself. This condition, or something near enough to it to satisfy the cultivator, may generally be realized in two or three years, or less; and we hold that, until it is gained, it is injudicious to wish or even allow a plant to blossom freely; because it is not competent to do so, without enfeebling those developments which are to give fulness and perfection to its subsequent display.

How far our opinion may be correct, or susceptible of application, in reference to dwarf shrubs, we leave each of our practical readers to determine. We can only allude to the well-known good effects of removing flowers when the advancement of the branches is desired, and to the extraordinary fertility of mature specimens that have not been subjected to premature exhaustion by early blooming.

With respect, however, to climbers, and, especially, the species to which this paper is devoted, we must be more positive in our statements. It is essential to them that they be permitted to reach a given size before blossoming liberally; since a very young, or a very imperfectly developed or stunted *Bignonia* cannot generate the healthy lateral shoots, from which alone flowers can be protruded. Maturity is, indeed, indispensable to its fertility.

Descending to the more direct and practical bearing of what we have advanced, we denounce the idea that small pots can be in any way advantageous to this tribe, and would have them altogether disused for specimen plants of every description. We speak of them, however, only with an eye to their diameter, which is the ordinary acceptation of the phrase. As substitutes, in all sorts of in-door culture, we would strongly recommend the adoption of comparatively shallow pans, which can be of any breadth, according to the size or nature of the plants, and ought to be little more than half as deep as they are wide. We have seen these employed for low shrubs in some of the houses at the Royal Botanic Gardens, Kew, and for Cacti in the superb collection of the Rev. Theodore Williams, Hendon.

When pots of this shallow character shall come into common use,—as we are satisfied they shortly will, since they are made upon a principle which is emphatically philosophical,—we shall look for a very striking change in the appearance of our plant-houses. Flowers will then, unquestionably, be far more abundant; and the difficulties—hitherto deemed insuperable—in the way of blooming those species which resist all other efforts at inducing fertility, will, in time, dwindle away into oblivion.

The sanguineness of our expectations from so trivial a change may expose us to some degree of ridicule; and however much we may disregard this, we should regret any influence it might have on individuals in deterring them from personally testing the truth of our calculations. Let us, then, add, that the propriety of using shallow pots, and the benefits which will result from their employment, are so completely wrapt up in a fundamental rule of culture, which all enlightened men acknowledge, and which is every day gaining fresh tributes of praise, that the one and the other must fall together. The rule we have in view, is that of retaining the roots of plants as near as practicable to the top of the earth. It has been prized and acted upon by fruit-growers for a very long time; and though floriculturists have been too slow in following their example,—as they are in several other important matters,—they have at length, we trust, been fully awakened to its extreme rationality and usefulness. Let us further suggest that we do not look for such extraordinary benefits from the use of shallow pots alone, but from this in concert with other equally excellent plans which are now just beginning to create the attention they demand.

To Bignonias, the foregoing advocacy of shallow pots is singularly applicable. Placed, too often, in some dark corner, where the rays of the sun never reach the soil in which their roots are rotting or starving, they are planted in a very large or very small pot, and, while their stems are trained over the roof, and duly exposed to light, it is a topic of wonder that they do not flower. Not a few who pass for good cultivators imagine that if the leaves and branches of plants have an adequate supply of light and air, they must bloom successfully. The absurdity of such a notion is, however, grossly palpable. Crude, uncongenial, superfluous, or improper food, can never be rightly assimilated; and no more efficient auxiliary preventive for these evils can be found than that of compelling the roots to spread themselves just beneath the surface of the soil by having pots too shallow to admit of their penetrating deeply. For the efficacy of such pots in inducing fruitfulness is not wholly due to their bringing the roots within the action of the air, but to their aiding drainage, and preventing, thereby, the accumulation of hurtful (because stagnant) fluids.

But, as will have been gathered from the commencement of the last paragraph, pots of the most approved construction will lose their value if they are not set where light and air can freely play upon their contents. Hence the urgent necessity for refraining from keeping them in darkness or seclusion, or out of the reach of those great agents. By some strange inconsistency, while common shrubs are always put in suitable positions, not too distant from the glass, climbers are placed beneath a stage, or surrounded by tall plants that effectually shade their roots and the lower parts of their stems. It cannot be too energetically made known, that no degree of kindness bestowed upon the upper branches can compensate for the absence of what is so absolutely necessary to the roots. Unless, then, the pots containing Bignonias are elevated on a stage, shelf, or other erection, in a similar way to the choicest shrubs, and alike relieved from all external encumbrance or shade, the plants will never merit cultivation, and had better be discarded.

Nor must it be assumed, where beds of earth, of greater or lesser extent, are provided for these species, instead of pots, that the principles we have propounded are at all susceptible of modification. The shallowness of the soil is still to be ensured; and this can easily be done by forming a thick layer of rough drainage substances beneath it. Through such a layer, if aptly prepared, the roots will never be able to insinuate themselves; and, thus foiled, will be rather attracted yet nearer to the surface. Sufficient elevation, again, to catch the rays of the sun and receive the healthful influence of the atmosphere, must be carefully secured; even though it may require a peculiar and somewhat inconvenient process to gain it. If the plants are to be trained from the sides of the house, towards its centre, boxes of wood, slate, brick, or stone, may be constructed for each. They should invariably be as high as the stage, if there be one, and have the space below the soil left as open as possible. When the specimens are to be planted in the middle of the house, similar measures may be taken; or where there is a central pit, each plant can be assigned a compartment therein. Where the pit is entirely filled with plants that are divested of pots, it will be advisable to set off, with thin slate, stone, or tiles, that portion of earth which each is to occupy, that the stronger kinds may not encroach on their weaker neighbours. The bottom of the pit, under the bed of earth, should also be perfectly hollow, with cavities in the outer walls to permit its permeation by air.

Once more to turn our attention to the propriety of letting specimens of Bignonias arrive at maturity before they flower with their natural prodigality, we must explain our meaning to be that their stems should grow from fifteen to twenty or thirty feet long, according to the species, and proportionally stout, ere the proper means for throwing them into blossom are resorted to. What those means are will be hereafter mentioned. At present, we wish to enforce the doctrine that strength and ripeness must be preliminary to floral development; and that precocity of bloom, as in the human mind, terminates in feeble mediocrity. Not that we would have all early flowers abstracted; for, besides being pleasing, they may really improve the plant, by draining off some of its more leafy luxuriance. But we would scrupulously abstain from encouraging them at such a time, and the more so, because, if the roots are tended as we have advised, exuberance can hardly be experienced.

No one, we are sure, will question the fact that genuine maturity of growth is constantly attended by profuseness of inflorescence. And the inference which naturally succeeds it, that ripeness must be attained when any quantity of flowers is sought, will be as little disputed. But it may be affirmed, with truth, that the shoots of the youngest plant can be, and ought to be, matured every year. Conceding this, however, there is another maturity of which we speak—the maturity of the entire individual, and not of any of its particular parts; and this state is indicated by an arrival at that size beyond which the species rarely or very triflingly extends itself. It is a ripeness of this character which we have observed to be essential to Bignonias and the like objects. The two or three years passed without flowers in order to gain it, are more than compensated by after showiness; since, when a plant has reached what we would call its meridian, or a condition not far from it, it will go on annually blooming, in the greatest prodigality, till it is literally enfeebled by age.

To bring a Bignonia, then, to the stage which we have just glanced at, we deem it prudent to supply it with all needful nourishment in the way of soil. We consequently prefer a somewhat rich loam, with scarcely any heath mould, and only a small proportion of sand. With these, and a tolerably wide space for its roots, it will grow in great vigour for the first two years, and after it has enlarged itself to its average extent, the proximity of the roots to the surface will be alone adequate to the suppression of further luxuriance, and the instigation of blooming tendencies.

During the earlier part of its progress, pruning may be exceedingly beneficial, as well to cause it to protrude lateral shoots, as to remove the weak extremities of its main stems. With those species that send out very long shoots in one season, reduction is particularly desirable. The side-branches, too, that are formed prior to the maturity of which we have been descanting, should be all shortened, that they may not begin flowering too soon. The pruning can be done in the winter or late autumn months; and the plants will rarely require other tendance, except the timely fastening of the leading shoots to the rafters or trellis which support them.

We have hinted at the means by which fertility may be at once occasioned, as if they were of an active nature. This is far from being the case. They consist simply in leaving the lateral branches untouched. The principal error in the management of Bignonias that have gained a flowering state, is the pruning and shortening of their side-shoots. These should be left entire, and they will then bloom in the following season.

Such numbers of cases, verifying the preceding direction, have occurred beneath our notice, that we believe it equally efficacious with all Bignonias. The only deviation from it which is requisite, is for rendering such productiveness permanent. Instead of passing over the whole of the lateral shoots, half or a third of them should be pruned back, to furnish fresh ones for the ensuing year; and, in the winter previously to that year, the old laterals that have flowered so finely, may themselves be cut back; thus, by alternate sets of shoots, having a superior display every summer.

Those who would be disposed to cavil at the length of this article, will, perhaps, relinquish their objections, when they reflect on the important subjects, affecting all cultivated plants, which are discussed in it, and which, in truth, constitute the main part of its substance. We are ever loth to give much space to isolated topics, unless they comprehend principles which are interwoven with the very nature of general cultivation.

HINTS ON THE CULTURE OF GESNERA ZEBRINA.

At the time when these pages are presented to the public, they will have a good opportunity of ascertaining the real beauty of that superb plant which will now engage our attention for a short period. It is doubtless yet blooming in most nurseries where stove plants are grown ; and in not a few private gardens.

The highest praise we might bestow upon it would hardly overrate its merits. It is one of the small class that has foliage of the most interesting character ; flowers which are numerous, lasting, and of a highly elegant and handsome description ; and a blooming season which, beginning at the end of September, lasts through the dull months of October, November, December, and often through January and February. An excellent figure of it in our Magazine for January last, precludes the necessity for further description.

Probably one of the best traits of this ornamental species is the freedom with which small specimens flower while in a very young state. We have seen diminutive plants, with a stem not more than three inches high, and in pots only one size larger than the smallest that are used, throwing up a spike of flowers which was actually larger than the entire specimen besides. Yet, although so prolific in infancy, it is remarkably susceptible to good culture, and displays, perhaps more than any other *Gesnera*, the beneficial effects of favourable treatment.

Another characteristic which adds to its interest, and which will promote its diffusion and popularity, is the peculiarly liberal manner in which it propagates itself. Like the new species of *Achimenes*, which have already been dispersed through almost every garden where they can be cultivated, it increases most prodigally by throwing up a kind of sucker, which has a small tuber attached to its base, and which, when detached, speedily becomes an independent and healthy plant.

Of a plant which is either now, or will very shortly be, so easily procured, which is so strikingly attractive in all its features, and yields an immensely improved appearance to the cultivator's care, it is assuredly to be desired that the best method of treatment be known. We intend, therefore, embodying all we have observed concerning it in the present paper.

Conformably with our usual practice, we shall first point out those things in its management which are inappropriate and injurious. And here we have to note its being mostly kept in too small a pot. Gesneras are not plants that have very strong or very spreading roots. Still, their roots are succulent when in vigour, and being of annual formation, with a soft surface, imbibe a considerable quantity of fluid, and are damaged, as well as prevented from absorbing properly, by contact with any hard substance, such as the side of a pot. The stems, too, which are likewise large, juicy, and porous, demand most abundant and continuous supplies; and are necessarily much stunted when the roots are but imperfectly furnished with fluid resources, or are otherwise disabled from performing their full functions. When it is noted that there is a large tuber to support, (with a multitude of smaller ones in *G. zebrina*,) exceedingly copious and succulent foliage, and particularly abundant inflorescence, it will be seen why, though the roots are not unusually numerous or strong, complete and unobstructed freedom should be requisite for them.

The consequences of insufficient pot-room are apparent in the much greater debility of the plants. Their stems are not so stout, their foliage is small, broken, imperfectly formed, and lacking that charming green velvety aspect which it assumes when quite healthy, and the flower-stems, while they appear earlier in the season, are feeble, and the blossoms of far shorter duration.

But, if the pots used for this plant be deficient in breadth, it would not be prudent to employ much larger ones without they were, at the same time, less deep. Grossly as the roots feed, they must not be drawn far beneath the soil, or they will send up such a current of fluid as would create only more luxuriant stems and leaves, without improving (and most likely deteriorating) the flowers. The shallow pots advocated in a preceding page are, therefore, of the greatest moment for Gesneras. Pans from nine to ten inches broad, and a little more than five inches deep, contracted very slightly at the bottom, and frequently perforated there to secure good drainage, would be the fittest of all receptacles for the plant under consideration.

Small or deep pots are not, however, the sole causes of its ordinary weakness. It suffers quite as seriously from the poor and innutritious soil in which it is sometimes potted. The whole of the circumstances which we have enumerated as proving larger pots essential, combine to show that a more nutritive earth is alike needful. We have mentioned its vigour and succulence, the energy and absorptive nature of its roots, and the heavy demands made on them by the luxuriance and expansiveness of the parts that are above the earth, and how are all these wants to be met but by additional nourishment in the soil?

As a compost which will be found to answer well in ordinary cases, we would prescribe a fine rich loam, in the proportion of five to eight, two portions of leaf-mould, or thoroughly reduced manure, and the remaining one of sand and heath-soil mixed. The above will be by no means too strong or too retentive where shallow pots are used; and it may be modified in peculiar circumstances. For example, when it is thought worth while to grow a plant or two in a small pot for the sake of having it bloom earlier, the soil should be proportionably poorer; for there would be a clear incongruity in nourishing a plant highly, and, simultaneously, preventing it from putting forth its increased powers. Besides, a poorer soil will aid in bringing it into flower sooner.

A further reason why Gesneras do not reach the perfection of which they are capable, is to be traced in the retention around their roots of the soil in which they grew the previous year, merely putting a little fresh mould on the outside. This may not be a common practice, but we are satisfied that it exists. A Gesnera, after it loses its stems, is set on a shelf or other dry place in the stove, and the earth about becomes completely hardened and unfit for the new roots to enter in the spring. When excited, it is watered a little; and the soil, thus partially softened, is left unchanged, or simply the external coat removed, and a small portion of new compost put in its place. The proper plan is to take away all or nearly all the old earth, and give the young roots a compost into which they can instantly strike, without impediment or interruption, and with the certainty of receiving congenial food.

What else is most wanting in the culture of this species and its allies, is a duly moist atmosphere. Kept in a partially dry stove, their natural succulence—which is so closely connected with their beauty that the one cannot be diminished without lessening the other—is so repressed that they cannot expand themselves favourably. All their features acquire an unhealthy cast, and wear a displeasing, pale, impoverished hue. A humid house, scarcely less so than those devoted to Orchidaceæ, is most suitable to Gesneras; and nothing can atone for the lack of a moisture produced by evaporating water, save the exhalations from fermenting bark.

The mention of the last named substance leads us to observe that bottom-heat, produced by it, or by manure or leaves, is especially grateful to Gesneras; as it gives them the humidity they need in a perpetual and unvarying manner, and affords that stimulus, in respect to warmth, which all plants, of succulent habits, delight in while growing.

Though affecting, naturally, secluded and shady places, for the most part, this genus does not succeed best in a darkened house, or one which has a northern aspect. Much light, and closeness to the glass, are, however, on no account to be furnished. If potted in a tolerably rich soil, such as we have given an analysis of, an well watered in summer, while their pots are plunged in moist bark, or other such material, they will thrive most vigorously in a stove with the ordinary aspect, which is not shaded, except by a few climbers in the interior. Direct light will never harm them, unless the atmosphere be too hot or dry.

Perhaps the simplest, and readiest, and fittest mode of growing them would be to keep them in a hot-bed frame till they are about to flower. The closeness, and heat, and humidity, which exist in such a situation, will be in the highest degree propitious to their advancement; and as they will unavoidably be close to the glass, a little shade, by thin canvas, may not be unserviceable in sunny weather. In potting them, they may be placed at once in a pot of the size requisite for the whole season, provided they are watered at first with extreme care, so as not to make the soil "sour." If frequent shifting be preferred, the progress of their roots should be watched, and directly they appear on the outside of the soil, they ought to be transferred to a fresh pot. So delicate are their roots that the plants will receive a check if they are left too long unshifted, when those roots touch the side of the pot.

The freedom with which *G. zebrina* spontaneously throws up offsets, renders multiplication by cuttings superfluous.

It will be remarked that all we have said relates nearly as much to Gesneras in general, as to the more particular subject of observation. The whole of the species approximate so nearly in habit, that the treatment which suits one is adapted to all. The shrubby kinds, that are not tuberous-rooted, belong to a different class; and are not, of course, included in the section on which we write.

FLORICULTURAL NOTICES.

NEW AND BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR NOVEMBER.

ARISTOLO'CHIA GI'GAS. Such is the extraordinary character of this species, that Dr. Lindley remarks, "well might this flower, although growing on a small plant in a flower-pot, excite the astonishment of the visitors to the garden of the Horticultural Society in the months of June and July last; for certainly it is a rare event, even in the prolific regions of the tropics, to meet with so strange a production. If we were given to fancies, we should speculate upon the possibility of its being a cross between an elephant and an *Arum*, for the colour belongs to the latter, and the ear of the former, turned inside out, is no bad imitation of its form." The blossoms are immense, nearly heart-shaped, with a long slender tail; their colour being a yellowish white, blotched and streaked with brownish purple. "It was sent to the Horticultural Society by Mr. Hartweg from Guatemala, where it was also found by Mr. Skinner, who states that it is well known in that country under a name equivalent to Jew's-ear. It flowered for the first time in the garden at Chiswick last summer. It strikes readily from cuttings, and is well adapted for covering a trellis in a pot, and for training up the rafters of the cool stove." The odour of the blossoms is less offensive than that of some species, and resembles that of old tobacco. *Bot. Reg.* 60.

ECHI'TES SPLE'NDENS. A very remarkable and handsome new species, introduced by Messrs. Veitch and Son, of Exeter, through their collector, Mr. Lobb, from Brazil, and flowered last summer. The stems are climbing and vigorous, while the foliage is of unusual size, elliptical, acuminate, and nearly glabrous, though with prominent reticulations. The flowers are produced in axillary racemes, each having from four to six blossoms, which are very large, and of a pale rose colour, with a darker eye. It is a most valuable acquisition. *Bot. Mag.* 3976.

GODE'TIA GRANDIFLO'RA. "A native of the north-west coast of North America, the country above all others rich in handsome hardy annuals. Douglas, however, never met with it, nor does any trace of it appear among the collections published from the materials of other travellers. It is most nearly allied to *G. roseo-alba*, a plant the origin of which is not well ascertained. The flowers are the largest of any, and have a peculiarly delicate texture." Their hue is a whitish pink, with streaks of a deeper tint in the middle of each petal. "The plant forms a bush about two feet high, less spreading than *G. Lindleyana*. It flowers in July and August. Unfortunately no seed was saved of this handsome annual, which was raised from seeds obtained from North-west America, by the late Mr. Moreton Dyer." *Bot. Reg.* 61.

IPOMŒ'A TWEE'DIEI. Described as "a very pretty convolvulaceous plant, sent some years ago by Mr. Tweedie, from woods of the Parana, to the Royal Botanic Garden of Glasgow." It is most probably a stove species, and perhaps herbaceous. The stems are climbing and slender, the leaves being alternate, cordate, and acuminate. The blossoms are solitary, or produced in twos on each peduncle, and the corolla is "scarcely more than an inch long, red-purple, with five pale star-shaped lines." The plant is hardly deserving of cultivation. *Bot. Mag.* 3978.

Lœ'lia fla'va. An elegant and interesting species, figured from the collection of S. Rucker, Esq., Wandsworth. It first appeared in the garden of Sir Charles Lemon, Carclew, but having flowered imperfectly, the blossoms were supposed to be purple, and it was said to be a native of Mexico. The name of *caulescens* has been applied to it, but abandoned. It is now found to have bright and pale orange flowers, to be a native of Brazil, and related to *L. cinnabarina.* "From that plant it is distinguished by the shortness of the pseudo-bulbs, and of the sepals and petals; and also by the bluntness of the middle lobe of the lip, whose veins are more elevated and diverge considerably at the point, instead of being nearly straight as in *L. cinnabarina.*" It requires to be grown in a cool part of the stove or Orchidaceous-house, and fastened to a log of wood. *Bot. Reg.* 62.

Maclea'nia angula'ta. Allied to the splendid Thibaudias of Eastern India, and forming, in itself, a very ornamental plant. It is a stove evergreen shrub, of dwarf habits, and bearing its showy blossoms in May and June. The flowers are in threes, from the axils of the foliage, and are nearly an inch long, of a bright red hue, with a small yellow limb. The leaves on the younger shoots are of a delicate texture, and have a deep tinge of red. "It was blossomed by Mr. Forbes, in the stove of his Grace the Duke of Bedford, at Woburn, in June, 1842; and had been raised from seeds sent by Mr. M'Lean himself from the Peruvian Andes." *Bot. Mag.* 3979.

O'xalis rubroci'ncta. "Among the earth of Mr. Hartweg's Guatemala plants this sprang up and flowered in the garden of the Horticultural Society, in September 1841. It is a very neat-looking species, remarkable for the appearance of its leaves, which are very succulent, brittle, having almost a crystalline fracture, and bordered with a rich purple edge, within which is a distinct row of deep purple dots, many of a similar kind being scattered over the under side of the leaf. When dried, all this marking disappears." The flowers are of a lively yellow tint. "It is a greenhouse plant of easy cultivation, requiring to be potted in light rich soil, placed near the glass, and when growing freely it should be liberally supplied with water. After it has perfected its flowers and leaves in the autumn, they die off, and the soil must then be kept perfectly dry until growth commences again in spring. It is easily multiplied by dividing the crown of the roots." *Bot. Reg.* 64.

Tilla'ndsia ru'bida. This is a small "dry stove epiphyte, imported from Brazil by Messrs. Loddiges, with whom it flowered in February last. It is a very pretty plant, gay with madder-coloured flowers for many weeks. It will grow well in a basket, and hung from the rafters of the stove. The back or end wall of a pine-stove would suit it very well, and the general treatment should be the same as is applied to those plants." *Bot. Reg.* 63.

NEW OR INTERESTING PLANTS RECENTLY IN FLOWER AT THE PRINCIPAL SUBURBAN NURSERIES AND GARDENS.

Achime'nes peduncula'ta. A very valuable addition to our stove plants, on account of its blooming so prodigally during the months of September and October. It grows from eighteen inches to two feet high, has somewhat ovate and hairy leaves, and produces its flowers on long peduncles from the axils of the foliage. The blossoms are either single or in pairs, of a bright orange red tint, profusely spotted inside with a darker hue. It has bloomed most abundantly in the Gardens of the Horticultural Society, and at Messrs. Loddiges', Hackney.

Bego'nia—? Flowers of a new South American *Begonia* were unfolded at Messrs. Young's, Epsom, about three months ago, and remained perfect for many weeks. The species is furnished with singular descending pointed appendages to its leaf-stalks, somewhat like, but much smaller and less numerous than, those of *B. manicata.* They are also spread over the entire stalks, and not arranged in frills. Its leaves are large, and of a brilliant blood colour behind. The flowers appear in spreading panicles, eight or nine inches high, and are of a deep pink tint, having four large petals. It is a handsome acquisition.

Ca'ttleya ca'ndida. Messrs. Loddiges apply this name to a plant which is allied to *C. Harrisonii,* and has flowered in their collection. It has the habit of the species just mentioned, but very delicate and lovely white flowers, which have a trifling shade of pink, and a dash of yellow in the middle of the lip. The latter member is most beautifully curled, or frilled round the margin.

Ca'ttleya supe'rba. It is impossible to describe the colour of the flowers which this truly superb plant bears. They excel in richness everything of the kind we have before seen. The sepals and petals are of a lively purplish-crimson, and the lip is of the same hue, but very much deeper, and with a shade of blood colour in it. They are as large as those of *C. Harrisonii*, or *C. Skinneri*, and the lip throws back the sides instead of folding them together over the column. Its extremity is nearly square or truncated. The pseudo-bulbs are about nine inches high, and particularly stout. Messrs. Loddiges have had it in bloom twice this autumn.

Colu'mnea sple'ndens. Received by Messrs. Rollisson from Paris, and probably a South American or Mexican plant. It has the epiphytal character of *C. Schiediana*, with thick, oblong and shining foliage, and solitary blossoms. The peduncles are singularly long, which causes the flowers to hang down in a graceful manner. The colour of the blossoms is a reddish crimson, and the species seems altogether a desirable one.

Curcu`ma—? In Messrs. Loddiges' stove we noticed last month a kind of *Curcuma*, with very much of the aspect of *C. Roscoeana*, but having nearly white blossoms, or rather bracts. Although *C. Roscoeana* varies exceedingly in colour, this is evidently not the original species. It may possibly, however, be a variety. The bracts, as we have said, are almost white, being slightly tinted with pink, and having a deeper stain of pink in the middle and towards the points. They continue in beauty as long as those of the species above alluded to.

Franci'scea villo`sa. A new species of *Franciscea*, received from the Continent by Messrs. Loddiges, and flowering in one of their stoves. It is not unlike *F. Hopeana*, but has smaller downy leaves and deep purple blossoms. The latter are perceptibly fragrant. When it comes to be well cultivated, it will doubtless be as interesting as its very pleasing ally,

Gesne`ra magni'fica. One of the larger species of the genus, with immense leaves, and a woody stem eighteen inches in height. It produces a close spike of comparatively small red flowers from the summit, and certainly does not appear to answer to its name. Messrs. Rollisson, of Tooting, have lately bloomed it in a greenhouse.

Gesne`ra Mu'rkii. This is a much handsomer plant, having large and very showy flowers, which are, however, like those of *G. Cooperi, faucialis*, and some others. The blossoms take a half pendent direction, and in this respect it differs from its congeners. It is a highly ornamental species, and worth cultivating. We have observed it at Messrs. Henderson's, Pine-apple Place, and in excellent condition at Mrs. Lawrence's, Ealing Park.

OPERATIONS FOR DECEMBER.

Deciduous trees being, at this time, completely denuded, and this being the season at which alterations are commonly effected or devised, it will be advisable for the gardener to go carefully over his pleasure-grounds, and mark those places where evergreens are most needed. There are few gardens which are well furnished in this respect; and there is nothing that makes a spot look so miserable in winter as a deficiency of evergreens. Every good cultivator should always have a stock of laurels and common evergreen shrubs in reserve, to be applied in remedying defects, as occasion may arise. No season can be better than the present for examining an estate with a view to planting them; because the trees have so recently been clothed with their leafy honours, that peculiar barrenness of verdure is more distinctly perceptible than it would be at any other period. Nor is it yet too late even to plant what may be wanting; nor should the investigation be restricted to shrubs, but be extended to trees, whose effect may possibly not be fully felt for many years. It is a very narrow mind that refrains from planting what cannot be immediately or speedily enjoyed.

The annual pruning of hardy plants, and the clearing of shrubberies, with the digging of their borders, is mostly performed at this period. The mildest days should always be selected for pruning, and no object subjected to the knife but such as really need it. Far too much pruning is usually done among flowering shrubs; and hence the ungraceful, stiff, and displeasing character some of them are made to assume. With evergreens, such as laurels, the case is different. They are seldom pruned enough, and grow too straggling; or, where they come near a walk or the verge of a border, are cut up square, so as to resemble a hedge or wall.

Evergreens, growing as underwood in shrubberies or plantations, ought to have their upper branches shortened at this time. They are intended to form a dense thicket, but they will not do so naturally in such positions; and must, therefore, be judiciously pruned. Those, again, which stand near the boundary of a plantation, are designed for concealing its interior and disagreeable features; but they are also meant to form beautiful objects in themselves; and this they can never do, if pruned into an upright wall on one side. The remedy for such a proceeding is to put them farther back, where they would overhang the walk undesirably; or, when they are connected with a lawn, to suffer them to grow out upon it, merely reducing their extreme and rambling shoots. In the latter case, they will contribute greatly to the variation of the shrubbery's outline.

In numbers of localities where Rhododendrons have been planted for several years, and have not succeeded well, but have acquired lank and ugly stems, which are too much exposed to view it is a good plan to renew the soil about them, and layer all the shoots into this. They should not be cut in the operation, unless very slightly; and it will be found, next winter, that every branch has formed a distinct plant. The whole, in two or three years, if suffered to remain, will compose the handsomest bushes possible; or, the young plants may be taken up next autumn, and planted separately wherever required.

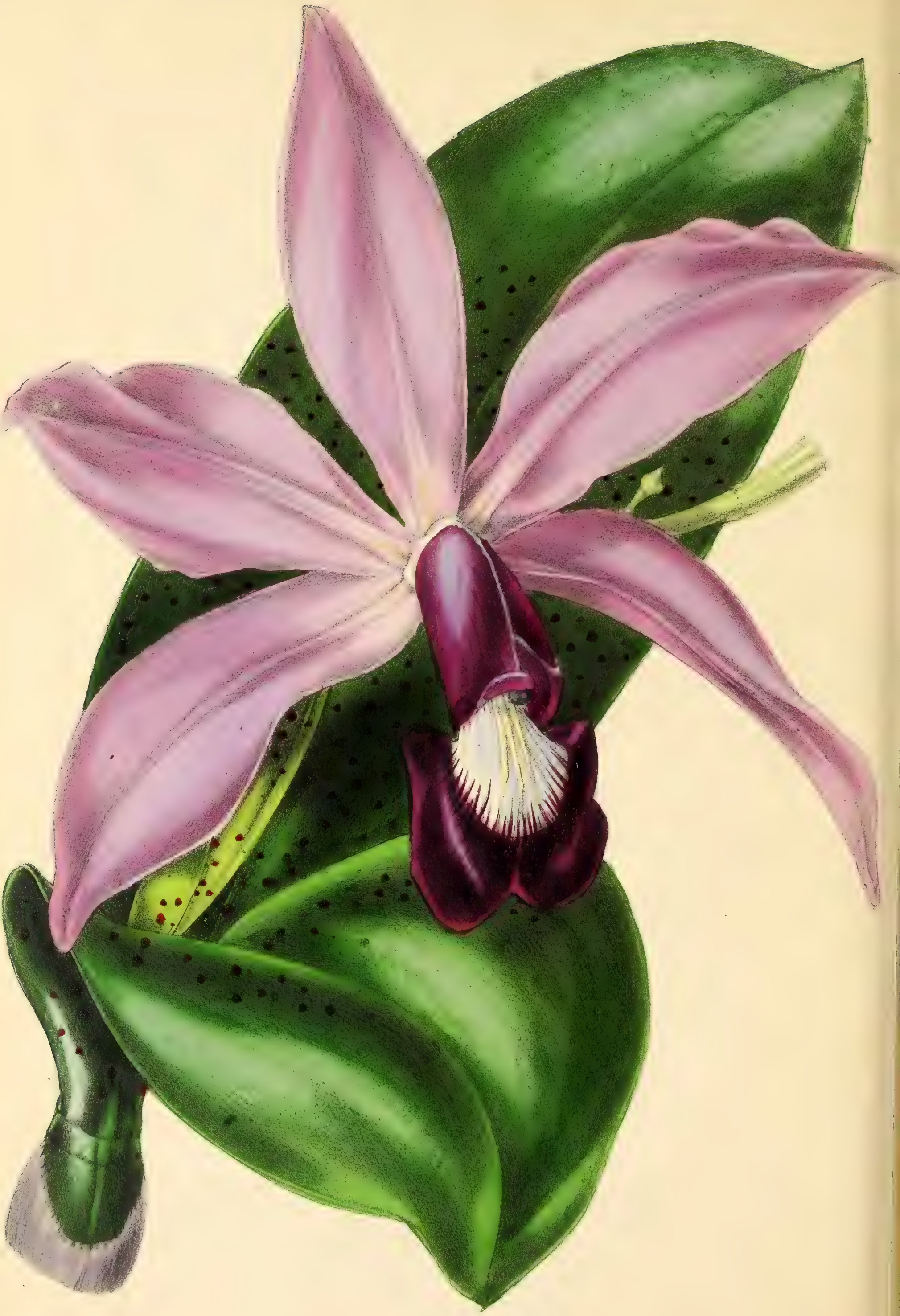
All roses, save those which are tender and have soft wood or much pith, should be pruned forthwith. It is better to do it now, not merely that the ground may be dug around them, but because spring pruning, unless effected at the precise time between the cessation of frost and the early flow of sap, is dangerous, and weakens the plants. The Chinese kinds, and those which resemble them in tenderness, should not be touched till the spring; though they never want much pruning. If cut now, their tender tissue would be exposed, and the winter's frosts would inevitably kill the greater part of the shoots that had been wounded. This is the most suitable time, however, for putting in cuttings of all such sorts. They can be planted under a hand-glass, beneath a south or sheltered wall; or put into pots, and placed in a cold frame.

Roses, *Cydonia Japonica*, Wistarias, Azaleas, and all woody plants that are propagated by layers, should at once be attended to. By running a sharp and thin knife through the shoot, just where it is to be buried most deeply in the ground, and where there is a joint or bud, afterwards giving the shoot a slight twist as it is laid down, it will root more satisfactorily. This is the season, too, for putting in cuttings of those hardy shrubs that are thus increased; such as the species of *Ribes*, &c.

Those climbers or other out-door plants which are supported by stakes, and which are now undergoing their yearly pruning or trimming, should be fastened entirely with new bands, where matting is the material used. It is customary to replace only those bands which have plainly decayed; and the result often is that the plants are prostrated by the spring gales, and possibly broken. The safer method is to take away every old band, and substitute a new one in its place.

In plant-houses, there is little to do beyond repelling frost, excluding dampness, and preserving everything as clean as possible. The thorough extirpation of insects may still be pursued in bad weather; and the forcing-house should be early fumigated, should it be infested with the different species of Aphis. In proportion as forced flowers are more tender and valuable, should they be guarded with the greater care from the attacks of insects; and measures taken in good time to check the advance of these pests.

Everything within doors should resemble, as nearly as practicable, all without, and be thoroughly torpid. To this end, water should seldom be administered, and only in small quantities. Fires should be avoided, when they can be dispensed with, and external coverings preferred. Air, likewise, ought even now to be given on every dry day that the temperature does not fall below the freezing point. By rendering the plants thus hardy, the effects of the winter will be far less prejudicially felt.



S. Holden del. & lith.

Cattleya superba.

CATTLEYA SUPERBA.

(Superb-flowered Cattleya.)

Class.
GYNANDRIA.

Order.
MONANDRIA.

Natural Order.
ORCHIDACEÆ.

Generic Character.—See page 1, of the present volume.

Specific Character.—*Plant* epiphytal. *Stems* about a foot long, pretty regularly swollen, and unusually roundish. *Leaves* ovately oblong, obtuse, coriaceous, marginate. *Sepals* oblong, acute; *petals* lanceolate, acute, membranaceous, broader than the sepals. *Labellum* three-lobed, cucullate: lateral lobes acute; middle lobe plane, toothletted, emarginate, with elevated veins at the base.

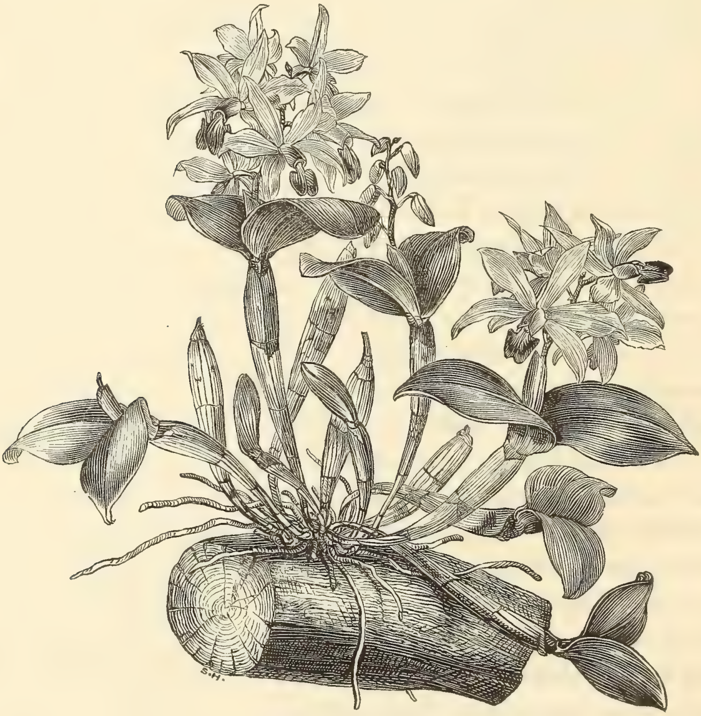
A figure of this truly superb object having been published in Dr. Lindley's noble Sertum Orchidaceum, we gather from thence that it "has been found in British Guayana by Mr. Schomburgk, who sent a live plant of it to Messrs. Loddiges. The flowers, if not so large as *C. Mossiæ*, are inferior to none in beauty. According to Mr. Schomburgk, the plant appears peculiar to the third and fourth degrees of north latitude; it is not to be met with in the Essequibo, north of the mouth of the Rupuruny; from thence it is found southward on trees which skirt the banks of the brooks and rivers which meander through the savannahs. He discovered only a few solitary specimens in the Essequibo south of the Cayuwini, and none at the Equator. The Caribbees call it Oponopodoli, or Ducksmouth; the Chacoosees Masane. It is very fragrant; the odour in the morning is said to become too powerful in a confined place; the splendid flowers last from three to four weeks.

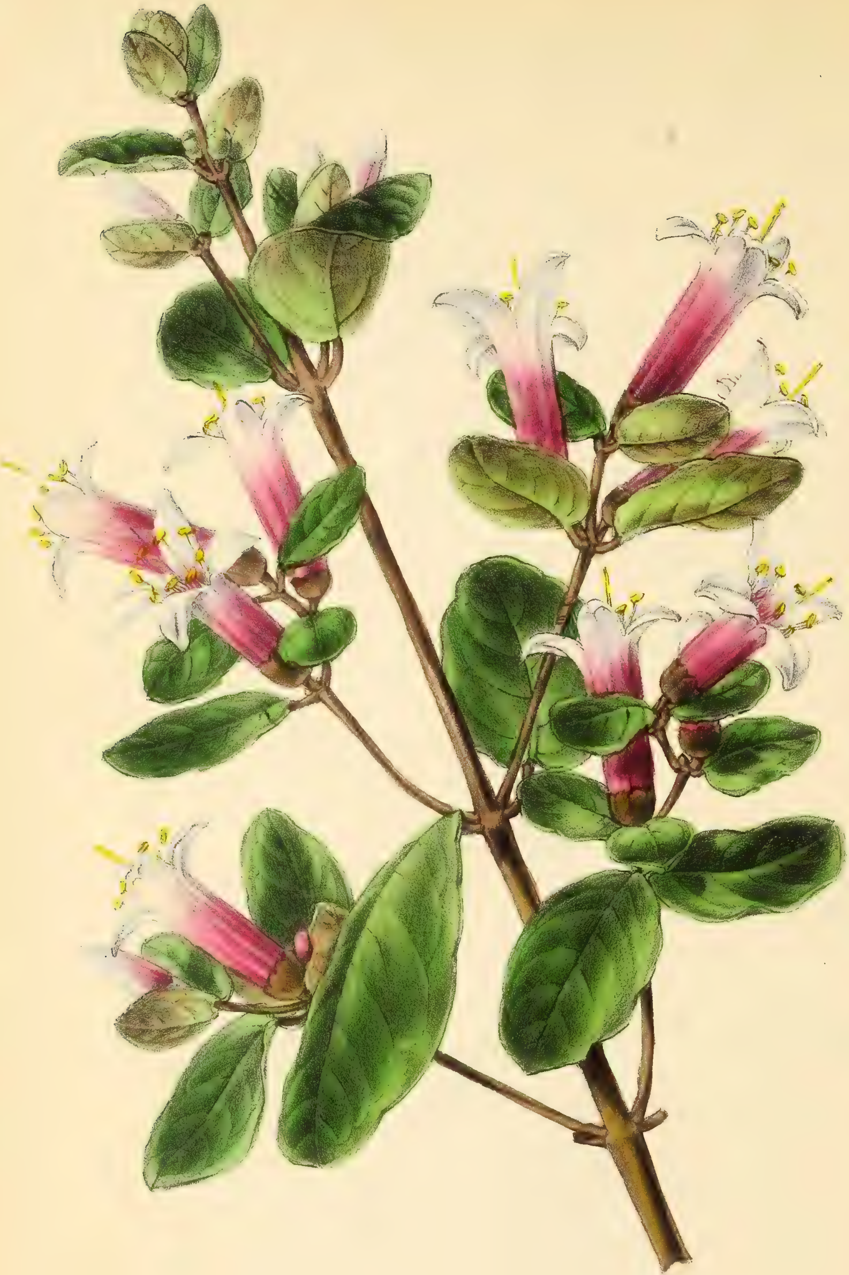
"Although only now brought into notice, the species was many years since discovered by Dr. Von Martius, who found it near Taruma, on the banks of the Rio Negro, and in forests near Para. It is readily distinguished from all previously described species by its three-lobed lip, with acute lateral segments, the middle lobe being flat, toothletted, and emarginate, and by the cluster of elevated veins at the junction of the two divisions of the labellum."

The flowers excel those of all other Cattleyas in the richness of their colouring, and, in fact, are equalled by no other known plant unless it be *Sobralia macrantha*. As already stated, they last a considerable time, and Messrs. Loddiges have had different specimens of the species in bloom for several successive months during the last autumn. It appears, also, to be very free-flowering; as the above gentlemen have blossomed it in very various states, and Messrs. Rollisson of Tooting have bloomed a plant that had not been many months imported. In both these establishments it is now tolerably abundant.

Specimens, planted in the usual mixture of heath-mould and potsherds, seem to succeed well if they are not subjected to too much heat and moisture. Like the rest of the Cattleyas, they do not flourish in a high temperature where moisture abounds. They will likewise thrive, but not so vigorously, on suspended logs of wood; and, in this case, they should have a more than usual quantity of moss placed about their roots, for, unless these are duly covered, the plants will remain stunted, and comparatively diminutive.

We owe our drawing to the kindness of Messrs. Loddiges, from whom it was obtained in September last.





S.Holden. del & Lith.

Corræa bicolor.

CORRÆA BICOLOR.

(Two-coloured flowered Corræa.)

Class.
OCTANDRIA.

Order.
MONOGYNIA.

Natural Order.
RUTACEÆ.

Generic Character.—*Calyx* cup-shaped, four-toothed or entire, permanent. *Petals* four, somewhat connivent at the base, or joined into a long tube. *Stamens* eight, equal or longer than the petals; the four opposite to them the shortest; filaments smooth, awl-shaped, or dilated above the base. *Ovary* four-lobed, densely beset with stellate hairs, and as if it were furnished with a calyptra. Style four-furrowed, smooth, terminated by a four-lobed stigma. *Fruit* of four capsular carpels; cells truncate, compressed. *Seeds* two or three in each cell, shining, fixed to the inside.—*Don's Gard. and Botany.*

Specific Character.—*Plant* a hybrid, conspicuous solely for its flowers, which combine the white and crimson tints of *C. pulchella* and *C. alba.*

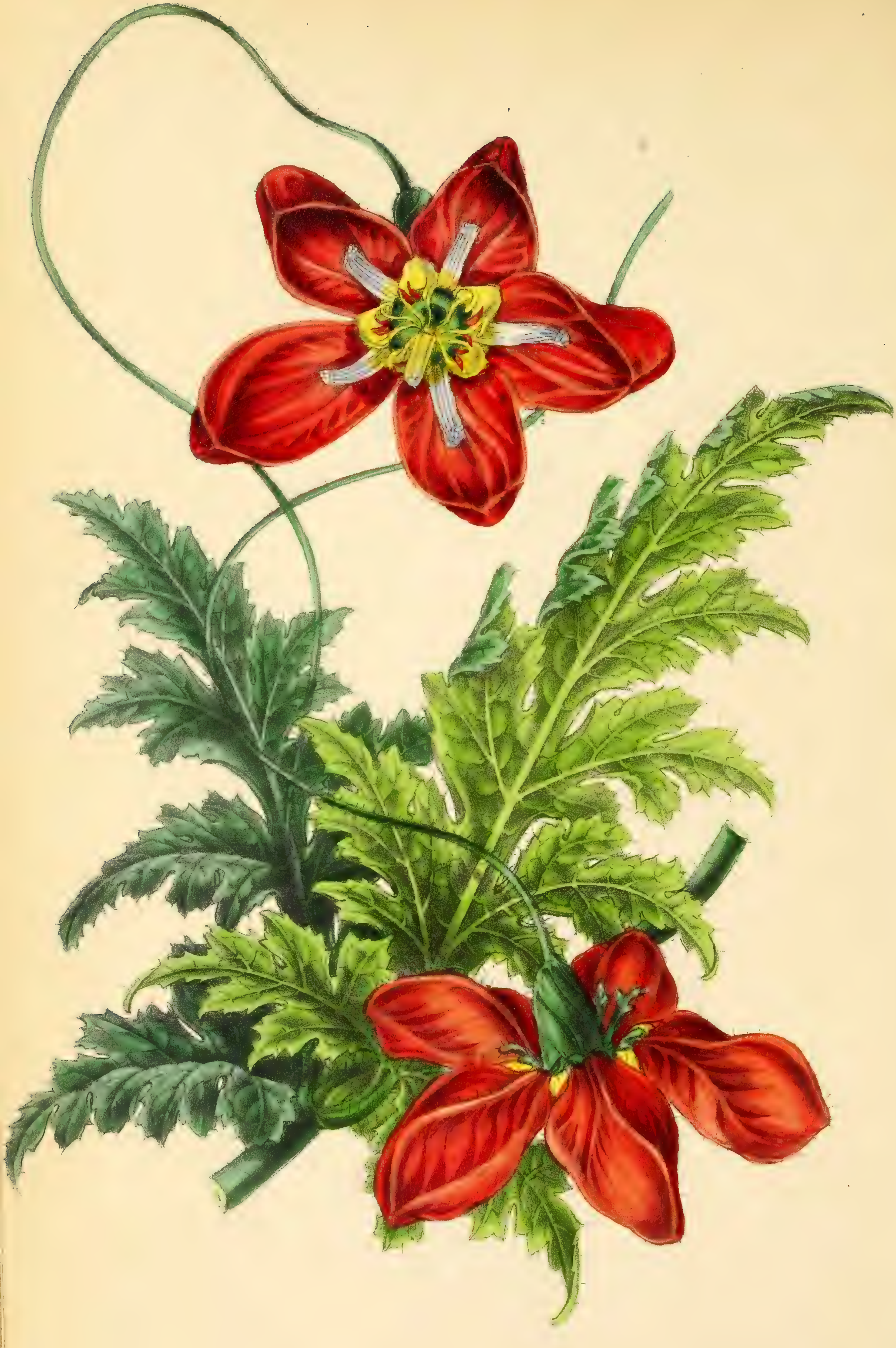
No fact has been more clearly developed within the last few years of gardening history, than that the intermixture of different species of plants, by hybridization, is quite endless, and that, after it has been performed, for several seasons, on particular objects, they become blended and confused to a degree that almost defies recognition. Even the florist is often unable to identify the same hybrid under altered circumstances, or when its treatment has been markedly dissimilar. And this makes us hesitate ere we sanction names (especially descriptive ones) applied to any seedling production, by publishing a drawing of that object, however beautiful it may be.

Some of the indistinctiveness which results in general cases, has, we fully believe, been experienced from the hybridization of Corræas. There are many kinds even now in existence, which, if placed by the side of others, would appear very nearly identical. Others, however, are so decidedly novel or distinct, that no subsequent modification of their properties is likely to remove their peculiarities; and among these *C. bicolor* is, perhaps, the most noticeable. It is so essentially different from all the rest, and so pleasingly beautiful, that we are gratified both in confirming the title it has received, and in admitting a representation of it to our pages.

It was generated a few years back, among other popular hybrids, and is most probably the offspring of *C. pulchella* and *C. alba,* as it possesses the hue of the blossoms of both in a combined form. The lower part of the tube of its flowers is a lively and delicate crimson, which passes into a whitish tint towards the upper portion. The segments of the limb, which are singularly large, are purely white within, and the prominent yellow stamens constitute a pretty relief. Its habit is neat, but not remarkable, and the foliage is tolerably good, with a slight tinge of brown on the under side.

With its allies, it is valuable for blooming through the winter months; when it renders the greenhouse gay for a very considerable period. Placed among the crimson-flowered hybrids, it creates a most delightful variety, and is very easily cultivated in a light loamy soil. Increase may be effected either by cuttings, or by grafting it on stocks of *C. pulchella*, *C. alba*, or *C. speciosa.*

At Mr. Knight's, of the King's Road, Chelsea, where we procured our drawing in the autumn of 1840, the plant is now blooming most profusely, and is both elegant and ornamental.



Loasa Herbertii.

LOÀSA HERBÉRTII.

(Mr. Herbert's Loasa.)

Class.
POLYADELPHIA.

Order.
POLYANDRIA.

Natural Order.
LOASÀCEÆ.

Generic Character.—See p. 7 of the present volume. Specific Character.—*Plant* a hybrid, with leaves and flowers most like those of *L. pentlandica*, but with the laxer and more climbing habit of *L. lateritia*.

At the seventh page of this volume, we gave a figure of *Loasa pentlandica*, and those who have our fifth volume will find a representation of *L. lateritia* at page 77. The plant which we now depict is a hybrid, between those two species, and a glance at the plates of each will show that it is most essentially like *L. pentlandica*, in regard both to the vigour and handsomeness of its leaves, and the greater size and deeper colour of its blossoms.

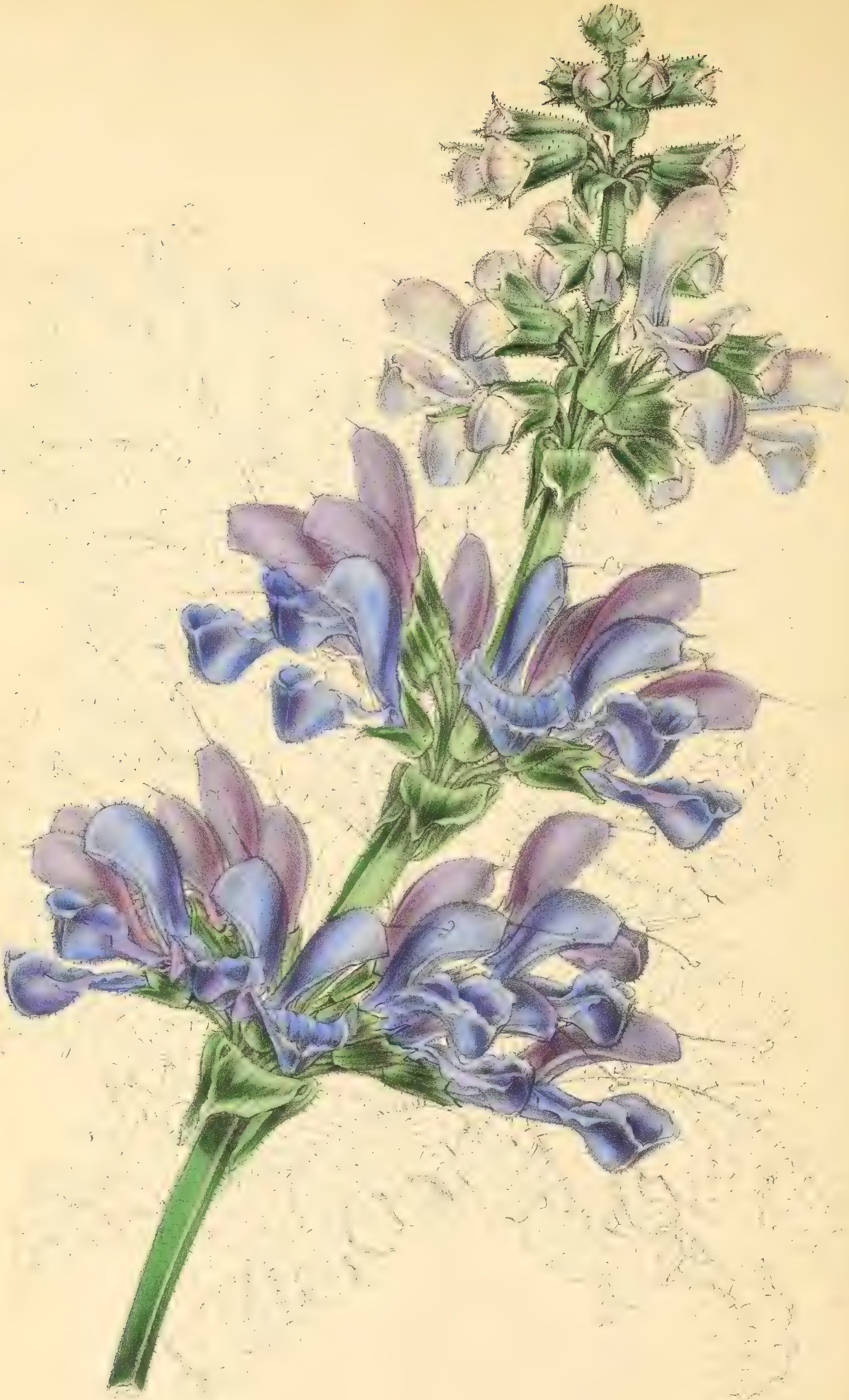
We stated, however, in the article which accompanies the drawing of *L. pentlandica*, that its habit was hardly loose enough for a climber, and that it was best adapted for planting in beds. Still, it can scarcely be questioned that a plant, the disposition of whose flowers is so very graceful that it would be hidden if the specimens were grown in masses, would be more agreeable as a climber ; and now that it has been hybridized with *L. lateritia*, and the more rambling, twining nature of that species has been happily incorporated with it, to just such an extent as to render it sufficiently diffuse, it has a powerful claim on the culturist's notice.

It will be seen from the two figures, that the foliage of *L. Herbertii* is less wrinkled or crumpled than that of *L. pentlandica*. The leaves of the latter species, though of a peculiarly deep green tint, always seem contracted, as if by disease ; and the stems also appear similarly repressed. In *L. Herbertii*, on the other hand, with an equally verdant aspect, there is a freeness, and boldness, and healthiness, which give the idea of pleasure that ever attends the examination of a plant in favourable conditions. In short, it has the better features of both its parents, with none of their defects, save the like capacity of stinging, which resides in its numerous bristly hairs.

As a greenhouse climber, it is well worthy of regard. Trained to a barrel-shaped trellis, its closer growth, superior foliage, and finer flowers, give it a far better appearance than *L. lateritia*, and it will bloom abundantly throughout the summer and autumn months. For a summer ornament to the flower-garden, for placing singly on lawns, for aiding to form a temporary and agreeable hedge where flowers are most desired, or for covering detached trellisses in the warmer part of the season, it is particularly useful.

From its origin, it will necessarily have to be propagated by cuttings, but this can be done with as much freedom and precision as the similar multiplication of numbers of half-hardy plants. If it is grown in pots, by plucking off the seed-vessels as they are formed, it is quite possible that the plant might assume a shrubby character, and last in perfection for many years.

It is named after the Hon. and Rev. W. Herbert, the Dean of Manchester. Our drawing was made in the nursery of Messrs. Henderson, Pine-Apple Place, in the summer of 1842.



S Holden del. & Lith

Salvia bicolor

SÁLVIA BÍCOLOR.

(Two-coloured Sage.)

Class.
DIANDRIA.

Order.
MONOGYNIA.

Natural Order.
LABIÀTÆ.

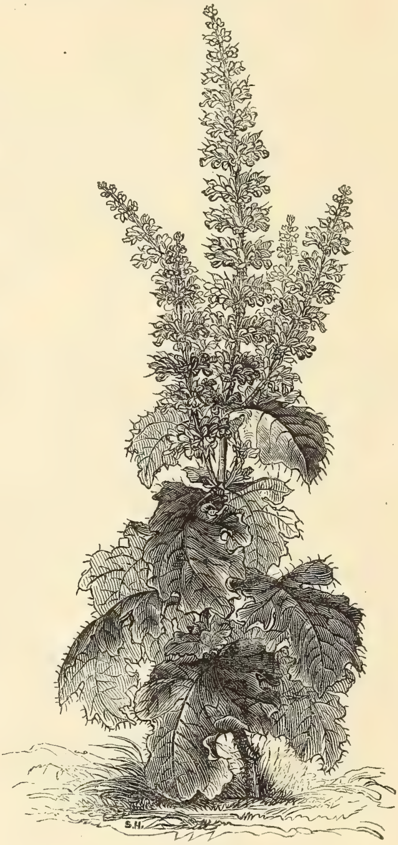
Generic Character.—*Calyx* ovate, tubular, or campanulate, bilabiate; upper lip entire, or tridentate; lower one bifid; throat naked inside. *Corolla* with an enclosed or exserted tube, which is equal, ventricose, or widened, sometimes furnished with a ring of hairs inside, sometimes naked, or sometimes furnished with two teeth or processes on the lower side at the base; limb bilabiate: upper lip erect, rarely spreading, straight or falcate, entire or emarginate; lower lip spreading, shorter or longer, with the lateral lobes oblong or roundish, spreading, reflexed, or twisted erectly, the middle lobe usually the broadest, entire or emarginate. *Rudiments* of superior stamens wanting, or small and club-shaped; lower two always fertile, inserted near the throat of the tube: filaments short, horizontal, rarely erect, articulated with the anther at top, and usually drawn out beneath the articulation, rarely almost continuous. *Anthers* dimidiate; connective elongated, linear, articulated transversely with the filament, ascending under the upper lip of the corolla, and bearing, at the top, a linear, adnate, or versatile fertile cell, and deflexed or erect behind, and sometimes bearing another smaller cell, which is either fertile or difformed, and empty; free, but usually combined together, or connate in various ways. *Disc* of ovarium glanduliferous in front. *Style* ascending, bifid at top; lobes sometimes subulate, equal, or the superior one is longest, and sometimes the lower one or both are rounded, dilated, and flattened. *Stigmas* for the most part minute, terminal, or in the larger part running along the lobes of the style. *Achenia* ovoid-triquetrous, dry, glabrous, usually very smooth.

Specific Character.—*Stem* erect, a little branched, clothed with clammy pubescence; lower *leaves* petiolate, ample, ovate, deeply toothed, pinnatifid or palmately-lobed; middle leaves petiolate, ovate-lanceolate, acuminated, deeply-toothed; superior leaves sessile, lanceolate, all cordate at the base, and clothed with clammy pubescence; floral leaves ovate, lanceolate, acuminate, reflexed. *Racemes* a little branched, elongated; *whorls* distant, six-flowered. *Calyx* pedicellate, campanulate, striated, clothed with clammy hispid hairs; teeth all subulate. *Corolla* three times longer than the calyx; the tube equalling the calyx. *Stamens* exserted.—*Don's Gard. and Botany.*

The plant, of which only a small portion is portrayed in the accompanying plate, is one of those ornamental objects which have been almost, if not entirely, lost to British cultivators; and which, as it is too showy ever to have been disesteemed, must have passed out of cultivation from carelessness or accident. It appears to have been made known nearly fifty years ago, being marked, in the catalogues, as an introduction from Barbary in 1793.

How long it has been neglected we have no means of knowing; but, by seeds received from the north of India, Mr. John Standish, nurseryman, of Bagshot, Surrey, has re-introduced it to our gardens, and it will doubtless prove a very acceptable acquisition, being, as Mr. Standish informs us, quite hardy, and exceedingly handsome.

It grows to the height of five or more feet, and Mr. Standish describes it as throwing up a flower-spike four feet high, which is covered with blossoms from the top to the bottom. It has a very vigorous and noble aspect, and when in bloom greatly resembles the much admired *Lupinus polyphyllus*, if viewed from a distance. It continues blooming through the greater part of the summer.



Being herbaceous and hardy, with very ample foliage, and such extremely attractive flowers, as well as so abundant and so durable a display of them, it will be valuable for planting in shrubbery or other borders, or for occupying the centre of large compartments in extensive flower-gardens, or for single specimens on small lawns, or for growing in pots to aid in furnishing the niches around a Grecian or other mansion during summer. It will thrive in any loamy soil, and requires no sort of attention beyond occasional division, and shifting every year or two into fresh soil.

In propagating it, either cuttings may be taken off in spring, and struck in a little bottom-heat; or seeds, which it seems to ripen, may be sown, likewise in a trifling heat, at the same period. The young seedlings can be gradually hardened, and planted out in May or June.

The wood-cut below will supply what is wanting, on account of insufficient space, in the coloured plate.

FLORICULTURAL NOTICES.

NEW OR INTERESTING PLANTS LATELY IN FLOWER AT THE PRINCIPAL SUBURBAN NURSERIES.

Gloxi′nia di′scolor. Apparently a hybrid, yet possibly an imported species. It has blossomed at Messrs. Rollisson's, and is peculiar for having the backs of the leaves richly stained with a brownish purple or blood-coloured hue. The blossoms are pale blue, approaching to white in the throat, and extremely pretty.

Gongoˋra —? Introduced by Mr. Hartweg to the gardens of the Horticultural Society, from whence it was obtained by Messrs. Henderson, of Pine-apple-place, who have recently bloomed it in their Orchidaceous house. It has short, small, ovate pseudo-bulbs, resembling those of a *Stanhopea,* and the flowers have yellowish sepals and petals, prettily spotted, with a broad and bright orange lip. The last feature is the most noticeable.

Maura′ndya —? A slender climber, allied to *M. Barclayana,* and differing from it principally in having delicate white flowers. Mixed with *M. Barclayana* on a trellis or against a wall. it would form a delightful combination, and for this purpose it will no doubt be much esteemed. It flowered, during the summer, in a greenhouse at Messrs. Young's, Epsom.

Niphæˋa oblo′nga. This charming little plant is bearing its snowy blossoms with Messrs. Rollisson, of Tooting. Its habit is dwarf, almost like that of a *Gloxinia,* and it blooms throughout the whole of the autumnal months, producing a large quantity of pure white flowers, which are nearly as large as those of *Gloxinia,* and have a blotch of yellow in the centre.

Onci′dium Lemoniaˋnum. Related to *O. pulchellum, triquetrum,* &c. It has small leaves which, if filled up in the centre, would be triangular, and the blossoms are elevated on a long waving spike. They are yellow and slightly spotted, with a very large clear yellow lip. It is a beautiful, but not a remarkable species. Messrs. Rollisson flowered it for several months this autumn.

Onci′dium microchiˋlum. A species having flattish pseudo-bulbs, and small, thick, rigid leaves. It bears its flowers on a strong erect branching scape, like that of *O. Cebolleti.* The blossoms are mottled with pink and light brown; and though the lip has the usual form at the base, it has no spreading lobe, like the rest of the species. On the whole, it is a very pleasing accession to the genus, and has bloomed finely at Mrs. Lawrence's, Ealing Park.

Onci′dium voluˋbile. For many months back a species of *Oncidium* has shown flower at Messrs. Rollisson's, and had excited expectation from the slender twining nature of its stems. It has since blossomed both with those gentlemen and Messrs. Loddiges. The flowers are small, and of the usual yellow and brown tint; and the species has little interest beyond the tortuous and twining character of the floral stems.

Scutellaˋria sple′ndens. An interesting little herbaceous or sub-shrubby plant, which appears to require the temperature of the stove. The leaves are ample and broadly ovate, and the flowers are borne in long spikes from the tops of the shoots; they are small, but of a very intense and brilliant scarlet colour. The plant has been in bloom all the summer at Messrs. Henderson's, Pine-apple-place, and many spikes are being developed at the present time.

Tropæˋolum azuˋreum. We omitted to mention, in the remarks on this plant which appeared with the figure, in our last month's Magazine, that its flowers have an agreeable aromatic fragrance. This circumstance will materially add to its interest. We should have observed, likewise, that it was imported *solely* by Messrs. Veitch and Son, of Exeter, who will necessarily have, for some time, the best plants for sale.

OPERATIONS FOR JANUARY.

From the warmth and length of the late summer, and the tardiness with which winter has approached, it seems rational to expect a considerable continuance of severe weather, when it does arrive ; and though this anticipation may possibly be disappointed, it will be in the highest degree politic to provide for the strongest contingencies.

Our notion that a sharp winter is likely to follow so very favourable a season is based on the view, which men of science appear generally to have adopted, that there is a kind of reciprocity between coldness and heat, and the duration of both ; or, to be more plain, that a long hot summer, or a succession of them, will be followed by one or a series of comparatively severe winters, and the converse. We caution the cultivator, therefore, against assuming that the immunity from cold we have already experienced, is likely to be perpetuated ; for, on the contrary, philosophy tells us that it will probably lead to unusual rigour.

This suggestion is but the prelude to a recommendation to prepare adequate means of covering in case of sudden severity occurring, and also (which is even more important) to keep the plants needing protection in such a quiet or unexcited state, that they may be secluded from the light for any requisite period without sustaining serious injury.

For covering pits, frames, or houses, nothing is so effectual (unless solid materials, such as asphalte, be employed) as straw hurdles, which can easily be made in wet weather. And if the frame-work be thick enough just to lift them above the glass, they will keep out almost any degree of frost, without fire. For plants standing in the open ground, again, garden-mats will usually afford the simplest and cheapest protection. They should be kept at some distance from the plant ; and a thick layer of dry hay, or some such material, should be placed over the roots, and around the lower part of the stem. Shelter *there* is of more consequence than is generally conceived, as it maintains the specimen in a drier condition, and prevents it from absorbing that unnecessary moisture which always forms a sort of nucleus for the attacks of frost. It, moreover, often keeps the plant from dying below the upper branches ; and there are some kinds of exotics which will sprout up afresh each spring, if the roots be preserved in safety, though the whole of their shoots be destroyed. The protection must, however, in all cases, embrace the lower part of the stem, where it joins the roots ; for, if this be killed, the roots themselves will never survive.

As regards the retention of plants in a torpid condition, the observation we have made concerns those which are grown in any protective structure, and also those which are sheltered in a detached manner. With the former, it is necessary to be most particular ; and the caution embraces the administration of water, the repressal of undue dampness, and the admission of air whenever it can be accomplished without danger. As to the application of water, it is now little needed, save in small and infrequent quantities ; and the more it can be dispensed with, so that the plants do not suffer from want, the safer and healthier will they be preserved. Dampness in houses may be removed by an occasional introduction of fire-heat ; and in frames, by sedulously avoiding its causes.

With respect to specimen exotics that grow in the open ground, and yet require covering in sharp weather, they can best be preserved in a torpid state by refraining to shelter them, more than very partially, till frost actually arrives. Where the protection is of such a nature that it must be kept on permanently, there should be the most perfect provision for supplying them with a current of air, and as much light as possible. Commonly, the last agent is the most thought of ; and an opening only is made on the side where the sun shines. If an aperture, however, be furnished on opposite sides, so as to have a free circulation of air through the whole, the health of the plant will be greatly improved.

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